RESEARCH ARTICLE

# Analysis of awareness of prenatal screening for diagnosis of genetic disorders

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The study was performed on people of the Kanyakumari district, Tamil Nadu, (n=201) to determine their practices towards reproductive decision-making. The main goal of the study is to analyze the participants' knowledge of the practices towards Prenatal Diagnosis (PND) and Termination of Pregnancy (TOP). Primarily due to the occurrence of consanguineous marriages (20%). Compared to TOP (39%), practice towards PND (61%) was more helpful. For an early diagnosis, PND is a good opportunity for parents. In Kanyakumari district, most people will have an awareness of genetic disorders, prenatal diagnosis, and termination of pregnancy. Mercy (22.60%), religious belief (12.8%), and sin (12.2%) are the major influences on the participant's practices concerning prenatal diagnosis and termination of pregnancy. The fetus was diagnosed with a genetic disorder before 120 days of pregnancy, they have undergone abortion favored by 61.2%, and un-favored by 48% of the people. 62% of members responded to the diagnosis of a fetus with genetic diseases before delivery, and 38% were not accepted in prenatal diagnosis. 50.8% of members not knowing the causes of a family history of genetic diseases. But 49.2% know the causes of a family history of genetic diseases. The reason for rejecting the above question was religious belief (12.8%), ethics (10.4%), culture (9.8%) mercy (22.6%), sin (12.2%), others reason (32.3%). Reason for accepting the genetic disorder before 120 days of pregnancy (50.2%) members would undergo abortion question was for getting a healthy child (68.9%), and preventing the affected child (31.1%). The challenge of the research is a small effort to identify people knowledge on consanguineous marriages and their effects.

**Key Words:** Prenatal diagnosis; Genetic disorders; Pregnancy; Non-communicable diseases

## INTRODUCTION

The developing countries like India are facing an increasing level of non-communicable diseases, congenital malformations and genetic disorders have become important sources of mortality in the perinatal period. Scientific advancements in genetic testing have moved us to an era of individualized preventive medicine. Screening of genetic disorders has the maximum possible potential to reduce the prevalence of genetic disorders through early detection and decisions making capacity of parents for prevention [1]. In India lack of general knowledge, awareness of genetic disorders, and also understanding of the fundamental characteristics of genetic disease [2]. The major concern in south Asian countries, that may have a high prevalence of genetically inherited diseases, because increased number of consanguineous marriages [3,4]. Blood-relative marriage is a marriage between close relatives of mother or father. In developing countries like India, a greater number of consanguineous marriages in the case of tribal community. So that a considerable increased cases of genetic diseases in the country [4,5].

Most of these genetic diseases not received global attention due to the wrong insight among health planners, clinicians and the general public that inherited diseases are less, affect only a minor proportion of people, and even if analyzed, are largely inoperable. Though, for the families concerned they represent a significant, continuing burden, unlike infectious diseases, which normally obvious only for some extent. Health care system inside India is provided by an integrated system of primary health centers, village health centers, sub-centers, community, district health officers, health centers and medical colleges. The reflective influence of caste in marriage has been confirmed by genomic analysis of modern Indian populations which has confirmed the continuing high level of gene differentiation, with marked divisions according to caste rank [6,7]. India is subdivided into two major regions about a fondness for, or circumvention of, consanguineous marriage but caste endogamy is common. The mainly Indo-European-speaking Hindu peoples in the northern states avoid marital unions between biological kin, because of a prohibition on consanguineous marriage believed to date back to approximately 200 BC [8,9].

In India people following some tradition which is followed by many years. Uncle-niece marriage, cousin marriage and unions between a man and his maternal uncle's daughter in Southern region [10]. This endogamy or consanguineous marriage is common in all Indian Muslim communities [11]. The levels of consanguineous marriages are going on in some Islam communities or some specific communities, that differences emphasize the important influence of local and regional customs in the arrangement of marriage contracts.

The burden of genetic diseases can be eliminated; patients are required to make some decisions concerning genetic testing in this regard. The understanding of the genetic disease and the patients toward PND; TOP was not accepted among participants. The main reason for this condition is religious belief influence on the participants 'practices concerning PND and TOP.

In this study, we are targeting the cross-section of the Indian community; males and females, both married and single with a wide range of ages and educational backgrounds as well as covering a diverse number of genetic diseases. Still in India more number of consanguineous marriage and it is mandatory to study, considering that the current premarital screening methods are not satisfying the screening purposes [12].

Linguistically, the term consanguinity is derived from two Latin words "con" meaning common, or of the same, and "sanguine" meaning blood, hence, referring to a relationship between two people who share a common ancestor or blood. In consanguineous marriage refers to marriage between biologically-related individuals. In genetics, a consanguineous marriage means a union between couples is related as second cousins or closer. Among them, this would include double first cousins, first cousins, first cousins once removed, and second cousins. Uncle-niece marriage is prohibited in Islam and so is absent in India. In population genetics, consanguinity may also refer to unions of individuals with at least one

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common ancestor such as those occurring within population isolates, small towns, and tribes; intra-community or endogamous marriages. The custom of endogamy among individuals belonging to the same family has been strongly favored in India, with the consequence of the unequal distribution of founder mutations among the population. A large number of studies into the effects of consanguinity on health and disease have not considered such discrepancies.

Genome sequence analysis has the potential way to reveal information are useful for diagnosis of disease and their prevention, as well as reams of data that is clinically not relevant to interpret with recent finding [13]. Technologies involved in genome sequencing will going to make genome analysis available to researchers in clinical and research findings, for example, in England genomics initiative plans to sequence 100 000 genomes for the National Health Service. In social science research that offers insight into what potential participants like to know from their genome sequence is both crucial and timely.

Wright et al., made survey in response to a particular question, understanding the cause of a child's developmental disorder. Genome sequencing can be an important tool to identify, mutations in genes involved in relevant to the disorder. It is difficult to analyze clinically related genetic variants among the many variants in an individual in the absence of a particular clinical question and a relevant phenotype or family history. Some of the causes of a genetic variant could be important, and factors influencing the penetrance of the variant were clearly understood, the data volume represents considerable logistical challenges [14]. Berg et al., recommend that the interpretation of sequence data could be categorized into 'bins' and only particular 'bins' of data interrogated and returned, for example, those relating to serious, curable conditions. Genomic researchers are also uneasy about the effect on analyzing and writing their findings unrelated to the study objectives risks compromising the research attempt. Logistical difficulties in future relating to this may comfort, in active searching case for particular become feasible. Irrespective of the realities, some suggest that genomic researchers have no legal active to an active search for ifs in research.

The sequencing policy development for both research and clinical sceneries should take care in the case of participant views and knowledge [15]. Jackson et al., review an existing paucity of data that can inform policy. Recently, some valuable, but small-scale studies have emerged from individual countries on the issue of data return in both clinical and research settings. However, as yet there have been no large international studies that gather data across stakeholders from multiple countries and continents.

Relevant participants include, but are not limited to members of the public, who are possible participants in sequencing studies genomic researchers like bio-informaticians and molecular scientists and perform computer–based analysis and create sequencing assays genetic health professionals of clinical geneticists, genetic counselors, and diagnostic lab staff have proficiency in genetics/genomics including data interpretation and explaining results to patients, and who may be called upon to validate sequencing findings obtained in a research context; non-genetic health experts of surgeons, general physicians, nurses, and midwives work in a healthcare setting and may patients care for receiving results from genomic studies. As genomics moves into mainstream medical practices, and also an increasing necessity for this public to explain on these issues.

Regrettably, genetic diseases always receive relatively less consideration due to the mistaken perception among health planners, clinicians and the general public that inherited diseases are very less, affect only a minimum proportion of people, and sometime diagnosed, are mostly incurable. Anyway, the concerned families represent a substantial, lifelong burden, unlike other infectious diseases, which generally manifest only for a limited period. Clinical studies revealed that there is more prevalence of polygenic disorders, like psychiatric illnesses of schizophrenia and manic-depressive psychosis, hypertension, diabetes mellitus, asthma in adulthood and coronary heart disease. The genetic makeup of these disorders is high compared to other. Moreover, high occurrence and a lack of general knowledge on genetics, most physicians not giving much importance to this type of genetic origin.

## MATERIALS AND METHODS

This study was carried out by cross-sectional survey, was conducted among people of Kanyakumari district from August to October 2021. The questionnaires were sent online (*via* email or WhatsApp) to both males and females of married and single. The questionnaire was prepared by earlier published literature and also included some additional questions following the local environments. With consent of the people questionnaire should filled by using mobile phones (consent like yes or no for willing to fill the questions; consent wordings were included at the starting of the Google forms in place of a separate consent form and participants were requested to register their willingness to participate) was gained from all participants. The survey questions are both in English and Tamil languages depending on the respondent's preference. To fill out the form it took around 2 minutes to be complete. The Google form questionnaire consist of two sections; the first section focused on socioeconomic and background information such as gender, age, education level, marital status, previous experience with unhealthy baby pregnancy, and abortion. While the second section questions identify the knowledge of Prenatal Diagnosis (PND) advantages and disadvantages, family history of inherited diseases, and whether participants would consider prenatal diagnosis and their practice toward termination of pregnancy if fetus was diagnosed with a genetic disease. The outcome variables of the study are TOP and PND, their response was 'yes' and 'no'.

The survey also records a qualitative analysis, which describes the views of the participants on the advantages and disadvantages of prenatal genetic screening (Figure 1). The advantages pointed out by the participants were characterized into prenatal diagnosis and genetic deformities; awareness on medical terminology, the reason for termination; psychological problems [16]. The disadvantages recorded by the respondents were categorized into many themes like religious beliefs, sin, Mercy, faith, expensive, and the choice of them). The choice of TOP was common between advantages and disadvantages depending on the view of participants. All the answers have been in Tamil and English.

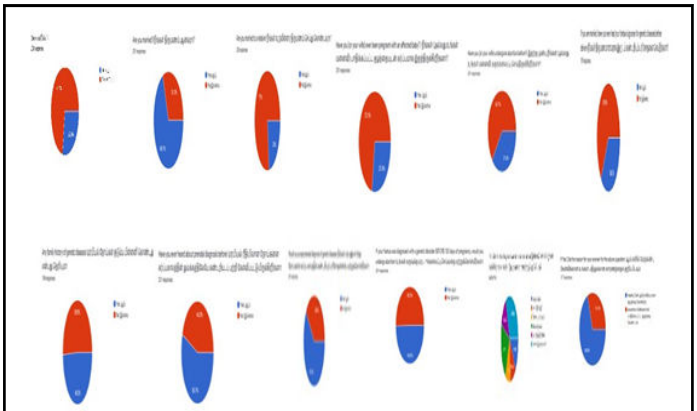

**Figure 1)** *Questionnaire and responses received*

## RESULTS

In India, due to its largest population, increasing birth rate, and blood relation marriages in many communities, genetic disorders are highly spread. The transversal study was performed on people of the Kanyakumari district, Tamil Nadu, both married and unmarried, with different age groups, educational backgrounds, and distinct generic diseases [17]. Early detection of genetic disorders by genetic testing can minimize the prevalence of genetic disease. Studies showed that, in Tamil Nadu, most people lack basic knowledge of genetic diseases and also do not understand them. India is a heterogeneous state with diverse cultures and traditional practices in different regions. A majority of the literature on consanguinity in India focuses primarily on the southern states. In response to the Google form questionnaires outcome is the expression characteristics of the study sample. Sample characteristics in total, 201. The most of the respondents were female (72.1%), male respondents in (27.9%), 25 below age (52.2%), and married (68.7%). Of the respondents, 29.5% were undergraduates and postgraduates 23.5%. Of the people with pregnant conditions with an

affected baby 72%. Of the respondents undergone an abortion before the delivery 37% and 62% had not undergone an abortion (Table 1). Of the people's knowledge of the causes of genetic diseases, only 49% and 51% don't have an idea about this.

In Indian cultural tradition consanguinity is practiced in different forms based on the family relationship of mother and father. Some tribal endogamous communities have a tradition of practicingmarriage among cousins, the other communities practice marriage between niece and maternal uncle.

TABLE 1

Response recorded and background knowledge of the respondents and practices toward prenatal diagnosis

| Question in the survey | Response | No. of responses | Percentage |
|---|---|---|---|
| **Gender** | | | |
| | Male | 56 | 27.90% |
| | Female | 145 | 72.10% |
| **Age** | | | |
| | 18-25 | 15 | 52.20% |
| | 26-30 | 37 | 18.40% |
| | 31-35 | 18 | 9% |
| | 36-40 | 17 | 8.50% |
| | 41-45 | 14 | 7% |
| | 46-50 | 10 | 4.90% |
| **Highest level of education attained** | | | |
| | $10^{th}$ | 9 | 4.50% |
| | $12^{th}$ | 16 | 8% |
| | Diploma | 31 | 15.50% |
| | ITI | 5 | 2.50% |
| | UG | 59 | 29.50% |
| | PG | 47 | 23.50% |
| | B.E.d | 16 | 7.5% |
| | MPhil | 5 | 2.50% |
| | Ph.D | 13 | 6.5% |
| **Are you married to a relative** | | | |
| | Yes | 154 | 77% |
| | No | 46 | 23% |
| **Have you (or your wife) ever been pregnant with an affected baby?** | | | |
| | Yes | 145 | 72.10% |
| | No | 56 | 27.90% |
| **Have you (or your wife) undergone abortion before?** | | | |
| | Yes | 75 | 37% |
| | No | 126 | 62.70% |
| **If you are married, have you ever had your foetus diagnosed for genetic diseases before delivery** | | | |
| | Yes | 72 | 36.20% |
| | No | 127 | 63.80% |
| **Any family history of genetic diseases** | | | |
| | Yes | 98 | 49.20% |
| | No | 101 | 50.80% |

| | | | |
|---|---|---|---|
| **Have you ever heard about prenatal diagnosis before** | | | |
| | Yes | 112 | 55.70% |
| | No | 89 | 44.30% |
| **Would you accept prenatal diagnosis of genetic diseases** | | | |
| | Yes | 123 | 61.20% |
| | No | 78 | 38.80% |

Table 1 shows the diverse types of consanguineous marriages stratified belong to the community based on women's background characteristics. 23% of people are married to relatives or blood relations on the survey, and 77% of the married people are non-relative. The majority (61.2%) respondents would reflect the prenatal diagnosis in a future pregnancy. PND advantages and disadvantages were n=123 and n=77 respectively among the total responses received. PND were characterized based on the opinion of the respondents depending on the advantages and disadvantages. Early diagnosis and improvement of genetic abnormalities answered by the respondents related to the advantages, regarding for disadvantages psychological pressure (n=172, 86%) was the highest. The 37.3% of people undergone termination of pregnancy, and 62.7% of the people not undergone an abortion, members are accepted TOP. The association between socio-demographic characteristics and practice toward PND at the vicariate level is displayed in Table 1, 61% of people accepting prenatal diagnoses of genetic diseases and 38% not accepted the prenatal diagnosis of genetic diseases.

## Practices influence on termination of pregnancy

The fetus was identified with a genetic disorder before 120 days of pregnancy, they have undergone abortion favored by 61.2%, and unflavored by 48% of the people. 72.1% of people with pregnant conditions with affected babies and 27.9% with members had an unaffected newborn (Table 2) [18]. 62% of members responded and accepted the diagnosis of a fetus with genetic diseases before delivery, and 38% were not accepted in prenatal diagnosis. 50.8% of members not knowing the causes of a family history of genetic diseases. But 49.2% know the causes of a family history of genetic diseases. The highest level of the person (55.7%) is ever heard about prenatal diagnosis (and 44.3%) not accepted it. 61.2% of members accept the prenatal diagnosis of genetic diseases, (and 38.8%) person not accepted it. If a fetus was diagnosed with a genetic disorder before 120 days of pregnancy (50.2%) of members would not undergo abortion but (49.8%) accepted in abortion, the reason for rejecting the above question was religious belief (12.8%), ethics (10.4%), and culture (9.8%) Mercy (22.6%), sin (12.2%), others reason (32.3%).

TABLE 2
**Practices toward termination of pregnancy**

| Question in the survey | Response | No. of responses | Percentage |
|---|---|---|---|
| **If your foetus was diagnosed with a genetic disorder before 120 days of pregnancy, would you undergo abortion** | | | |
| | Yes | 100 | 61.20% |
| | No | 101 | 38.80% |
| **If no, cite the reason for your answer for the above question** | | | |
| | Religion | 21 | 12.80% |
| | Ethics | 17 | 10.40% |
| | Culture | 16 | 9.80% |
| | Mercy | 37 | 22.60% |
| | Sin | 20 | 12.20% |
| | Others | 53 | 32.30% |
| **If yes cite the reason for your answer for the above question** | | | |
| | Healthy child | 122 | 68.90% |
| | Prevention of affected child | 55 | 31.10% |

The reason for accepting the genetic disorder before 120 days of pregnancy (50.2%) members would undergo abortion question was for getting a healthy child (68.9%), and preventing the affected child (31.1%). 92% of people are aware of genetic diseases of obesity, cancer, heart disease, and high blood pressure. Above 89% of their knowledge on diseases of multiple sclerosis, arthritis, paralysis, depression, and hypothyroidism. Less than 30% of people are unknown for diseases of microcephaly, cerebral palsy, albinism, sickle cell anemia, spinal muscular atrophy, thalassemia, hydrocephalus, and cystic fibrosis. Many people are unaware of genetic diseases below 10% are retinal dystrophy and fragile X syndrome (Table 3) [19].

TABLE 3
Respondents' knowledge on genetic disorders

| Question: Do you have knowledge on the following genetic disorders: Yes/No (%) | | | | |
|---|---|---|---|---|
| **Diseases** | **Yes** | **Percentage (%)** | **No** | **Percentage (%)** |
| Autism | 150 | 75% | 50 | 25% |
| Brain disorders | 150 | 75% | 50 | 25% |
| Cystic fibrosis | 135 | 65 | 65 | 35% |
| Mental retardation | 158 | 79% | 42 | 21% |
| Multiple sclerosis | 178 | 89% | 22 | 11% |
| Hydrocephalus | 140 | 70% | 60 | 30% |
| Retinal dystrophy | 120 | 60% | 80 | 40% |
| Obesity | 185 | 92% | 15 | 8% |
| Fragile X syndrome | 104 | 52% | 96 | 48% |
| Hypothyroidism | 176 | 88% | 24 | 12% |
| Spinal muscular atrophy | 135 | 68% | 65 | 32% |
| Hearing loss | 170 | 85% | 30 | 15% |
| Thalassemia | 158 | 78.5% | 42 | 21.5% |
| Sickle cell anemia | 131 | 65.5% | 69 | 34.5% |
| Depression | 173 | 86.5% | 27 | 13.5% |
| Paralysis | 172 | 86% | 28 | 14% |
| Microcephaly | 141 | 70.5% | 59 | 29.5% |
| Cancer | 182 | 91% | 18 | 9% |
| Arthritis | 173 | 86.5% | 27 | 13.5% |
| Albinism | 155 | 77.5% | 45 | 22.5% |
| High blood pressure | 184 | 92% | 16 | 8% |
| Heart disease | 185 | 92% | 15 | 8% |
| Cerebral palsy | 144 | 72% | 56 | 28% |
| Brain atrophy | 154 | 77% | 46 | 23% |

Rejecting abortion due to religious belief shows to be the main influence. They are thinking that abortion is not needed because it is a human or child gifted by God. They have the mentality of thinking that a fetus at 9 months of fetus growth may be recovered from the disease in the development of growth. The effect of the medicine may affect the fetus in development or may cause death. So there skip the abortion. They may be sentimentally attached to the fetus. It might be the first baby, so they skip abortion.

## DISCUSSION

Many numbers of factors significantly influence the frequency of genetic disorders. Consanguineous marriages are first common reason, mostly 40% of marriages among south Indians and Muslims in north India, and a lesser percentage among other groups. a large number of infants are born with genetic disorders because of the very large population and high birth rate is the second major reason. Finally, the advancements in diagnostic facilities and medical care that led to increased identification of genetic diseases which previously were hidden by malnutrition and infections.

This survey analyzed the practice of the Indian community regarding PND and TOP for genetic disorders, and also to conclude the factors that contribute to their practices. Especially in India like countries a greater number of genetic disorders are recorded, because of the increased number of consanguineous marriages, so conducting this area of study is need of the hour. Not only the consanguineous marriages, also the high maternal and paternal ages and the tendency to have large families as well as the lack of health measures contribute to the increase in the prevalence of such genetic diseases. Public knowledge and practice toward genetic testing are the major factors towards eliminating the burden of these genetic disorders depends [20].

In India cousin marriages are more observed than other types of consanguineous marriages belong to the socioeconomic groups. The highest percentage of women not married to their uncles and low percentage of cross-cousin marriages is evident among respondents; the women married to their uncles and cousins are belong to rural areas than in urban areas. Cousin marriage proportion is very high in the case of among socioeconomically disadvantaged groups of women married to uncles and cousins are greater such as those having poor economic status and less education.

Higher education levels, prior pregnancy with an affected baby, older age, and prior knowledge of the prenatal diagnosis are the favorable practices toward PND practice were significantly influenced by our findings are in line with other studies reporting fairly favorable practices toward PND. However, despite the helpful practices toward PND, participants held a difficult to come decision towards practice of TOP. In addition to education like undergraduate and higher education levels, some other factors also make them to give acceptance of TOP young in age, and having

prior pregnancy with an affected baby. Many of them more willing to TOP, people who are married and married to non-relative.

TOP many of the favored by, people who had an abortion before and had a fetus diagnosed with genetic diseases. The majority of participants felt that TOP is 'acceptable', noting that their acceptance was conditioned by performing Islamic regulations of abortion. Religion seems to be a major factor in participants' practice toward TOP as previously reported in other studies the main reason for not accepting abortion was religion.

The rural regions believe the fetus is considered a living human so they are not accepting termination after 120 days of pregnancy and as a result, TOP would be prohibited. There will be a great disability and suffering with before 120 days of pregnancy, TOP can be done if the fetal genetic or non-genetic condition is incompatible with life after birth. 120 days after it is permitted when continuing the pregnancy would risk the mother's life. The medical council of senior scientists in the Government provided the Ministry of Health (MOH) with an advisory opinion regarding abortion as the following: "Abortion should not be done without a medical decision from a specialized committee that can be trusted, and that committee has to have at least 3 doctors, then it is ok". Also, abortion cannot be done without the approval of both parents or the mother alone if there is direct harm to her only". Here we observed a high acceptance toward TOP in individuals with autistic cases in their family, unlike previous studies that showed a favorable practice toward TOP in hypothetical Down syndrome cases compared to autism. Both genetic diseases reported to cause stress in the family in coping with the conditions; however, they do perceive the severity of the genetic diseases differently.

The genetic diseases severity has a more impact on the acceptance of TOP among families with a history of intellectual disability. In comparison to the previous study, there is a marginal decrease in PND and TOP. Olwi et al., focused in his study on a well-educated region and only college students also, the study did not refine abortion as a single option. Contradictorily, the married respondents or their wives ever been pregnant with an affected baby were more likely to prefer TOP, while they were less likely to consider PND. This might be due to the previous experience of having psychological pressure followed by the diagnosis of an affected baby. There was a marginal increase in the rate of acceptance toward PND by the respondents, those who addressed the advantages of PND. One individual's response towards the benefits or advantages of prenatal diagnosis of genetic diseases was "prenatal diagnosis helps in protecting the lives of the child as well as the whole family from the disease burden and the negative aspects of the society". Furthermore, the majority of the responses addressed the advantages of PND. This reflects the positive thinking of the studied population. However, we cannot neglect the view held by a minority of people with the impact of the inaccurate PND and against faith. Moreover, only little percentage of participants felt that the PND is disadvantageous due to psychological pressure or the invasive nature of the procedure.

The vision and objectives is to improve the quality of healthcare services also transformation programs to prevention and therapeutic approaches to control diseases. In Future, the country is undergoing number of changes to fulfill a modernized healthcare system by implementing several programs that enlighten the public by increasing awareness on important health issues. The present report on the survey would collectively change the publics' knowledge and practice toward PND and TOP.

The strength of the study has various kind of cross-sectional survey with a large number of respondents, and the addition of parameters about the positive and negative effects of PND have been included along with reproductive-decision making. The comparative analysis of reproductive-decision making with additional influencing factors like various disease histories is worth mentioning. The study has also some limitations; It is not mandatory that the observation of the study population would translate into a real decision on PND and TOP. The study missed the opportunity to look at practices for different types of prenatal diagnosis (invasive/non-invasive) in the clinical area. Believe that our results reflect the practices of the Indians, but final decisions are always made based on the family situation of their own. The study excluded couples. The major limitation of the study is all the data were collected through online sources.

The genetic disorders are multi-factorial including hypertension, coronary artery disease, and also some psychiatric disorders are also large. The increased the burden of these disorders is greater than in Western countries inadequate diagnostic, management, and rehabilitation facilities. Genetic diseases although receive less attention from health services and research funding by the government. Common disorders like Down syndrome, neural tube defects, thalassemia, and muscular dystrophies deserves high priority, and genetic services should be integrated into the existing primary health care and medical services by community control method. Training physicians who staff of the village, district and medical school hospitals to provide genetic counseling. Also monitor to progress, also establish additional departments of medical genetics in medical schools depending on the need.

Family planning professionals should take necessary steps in terms of implementation, and give genetic counseling with family planning services, and also make them to aware all genetic disorders. In India for several health initiatives followed a major strategy has been successfully adopted with, two days per year set aside for the immunization of children against polio. Nearly 1,25,000 pregnant mothers screened and advised towards care and management under the government of India department of health scheme a 'protect-the-mother' campaign on two days in the year. All government schemes are important to create awareness towards screening or diagnosing all common genetic disorders. These schemes are aimed for genetic disorders and disabilities in the poor people. They also require the widespread mobilization of community workers and health professionals. While the Indian government has identified non-communicable diseases as a target for intervention, currently only diabetes mellitus, stroke, cancer and coronary heart disease receive attention.

The inherited, non-inherited genetic disorders, is a multi-sectorial activity in health care system and increased awareness through the population *via* education, specially of women, is the most important facet of disease prevention. More number of people in the country based on traditional forms of health care. The most important is to work with, and not against, practitioners of indigenous systems of medicine. A holistic approach should be emphasized in these systems to improve health that includes a nutritious and balanced diet, exercise, and a non-stressful healthy and happy lifestyle may that may prevent or reduce these polygenic disorders.

The occurrence of consanguinity was assessed by related features reveals that prevalent among disadvantageous socioeconomic groups. Need to network all the primary health care facilities with genetic screening units in medical colleges in all the cities. In the primary health centers of villages and sub-centers, and health practicing can be trained to provisionally identify individuals with genetic disorders. District health centers should be having the provision for simple screening for diagnostic tests for genetic counseling, complemented by and more urbane facilities can be served in large hospitals, medical schools, regional and national centers.

Disorders of congenital malformations and complex diseases, affect as many numbers of people. The affected families should be monitored and providing genetic counseling and prenatal diagnosis are of good to them if possible provide drug or enzyme replacement therapy is for an increasing number of disorders, and the other horizon is gene therapy. The major effort has to be taken to interact with all medical professionals and planners to educate everyone concerned as to emphasizing, the real situation about genetics, the continuing burden of these disorders in compare to parasitic disorders and infectious diseases. This challenge can be made by giving awareness to all levels of people in schools, colleges, and particularly in medical colleges and also in villages. Now a day's people are more aware about this genetic problem and their causes. In part of government concern this can be also achieved by giving training in genetics at all levels of people in schools, colleges, and particularly in medical colleges.

## SUMMARY

The fetus was diagnosed with a genetic disorder before 120 days of pregnancy, they have undergone abortion favored by 61.2%, and unflavored by 48% of the people. 72.1% of people with pregnant conditions with affected babies and 27.9% with members had an unaffected baby. 62% of members responded and accepted the diagnosis of a fetus with genetic

diseases before delivery, and 38% were not accepted in prenatal diagnosis. 50.8% of members not knowing the causes of a family history of genetic diseases. But 49.2% know the causes of a family history of genetic diseases. The person 55.7% is never heard about prenatal diagnosis, and 44.3% have not accepted it. 61.2% of members accept a prenatal diagnosis of genetic diseases, (and 38.8%) a person not accepted. If a fetus was diagnosed with a genetic disorder before 120 days of pregnancy (50.2%) of members would not undergo abortion but (49.8%) accepted abortion, the reason for rejecting the above question was religious belief (12.8%), ethics (10.4%), and culture (9.8%) Mercy (22.6%), sin (12.2%), other reason (32.3%). The reason for accepting the genetic disorder before 120 days of pregnancy (50.2%) members would undergo abortion question was for getting a healthy child (68.9%), and preventing the affected child (31.1%). 92% of people are aware of genetic diseases of obesity, cancer, heart disease, and high blood pressure. Above 89% of their knowledge on diseases of multiple sclerosis, arthritis, paralysis, depression, and hypothyroidism. Less than 30% of people are unknown for diseases of microcephaly, cerebral palsy, albinism, sickle cell anemia, spinal muscular atrophy, thalassemia, hydrocephalus, and cystic fibrosis. Many people are unaware of genetic diseases below 10% are retinal dystrophy and fragile X syndrome.

## CONCLUSION

Prenatal screening is a best way to control or prevent genetic or congenital disorder in newborn babies. Most of the public have the awareness on PND and TOP. The opportunity for the respondents will be the parent's choice. Respondents most of them are young and have the knowledge on all genetic problems which may be the reason for development is consanguineous marriage and that to be avoided in future.

## FUTURE SCOPE

The present study is a wide-ranging effort to reenter to gather information about awareness on blood-relation or consanguineous marriages and their effects among public are collected data using Google forms and analyzed by statistical methods This study creates awareness to the young people to prevent or control the extent of the prevalence of consanguineous marriage in Kanyakumari district and its reflect on adverse pregnancy outcomes among women and also on consanguineous marriages and their effects.

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## CONFLICT OF INTEREST

None.

## REFERENCES

1. Al-Amodi AM, Ghanem NZ, Aldakeel SA, et al. Hemoglobin A2 (HbA2) has a measure of unreliability in diagnosing β-thalassemia trait (β-TT). Curr Med Res Opin. 2018;34(5):945-951.
2. Alamri YA. Islam and abortion. Journal of the Islamic Medical Association of North America. 2011;43(1).
3. Al-Gazali L, Hamamy H, Al-Arrayad S. Genetic disorders in the Arab world. BMJ. 2006;333(7573):831-834.
4. Alkuraya FS, Kilani RA. Attitude of Saudi families affected with hemoglobinopathies towards prenatal screening and abortion and the influence of religious ruling (Fatwa). Prenat Diagn. 2021;21(6): 448-551.
5. Alsulaiman A, Abu-Amero KK. Parent's attitude toward prenatal diagnosis and termination of pregnancy could be influenced by other factors rather than by the severity of the condition. Prenat Diagn. 2013; 33(3):257-261.
6. Alsulaiman A, Hewison JJ. Attitudes to prenatal testing and termination of pregnancy in Saudi Arabia. Community Genet. 2007;10(3):169-173.
7. Alsulaiman A, Hewison J, Abu-Amero KK, et al. Attitudes to prenatal diagnosis and termination of pregnancy for 30 conditions among women in Saudi Arabia and the UK. Prenat Diagn. 2012;32(11): 1109-1113.
8. Alsulaiman A, Mousa A, Kondkar AA, et al. Attitudes of Saudi parents with a deaf child towards prenatal diagnosis and termination of pregnancy. Prenat Diagn. 2014;34(2):153-158.
9. World Health Organization. Community control of genetic and congenital disorders. 1997.
10. Bamshad M, Kivisild T, Watkins WS, et al. Genetic evidence on the origins of Indian caste populations. Genome Res. 2001;11(6): 994-1004.
11. Berg JS, Khoury MJ, Evans JP. Deploying whole genome sequencing in clinical practice and public health: meeting the challenge one bin at a time. Genet Med. 2011;13(6):499-504.
12. Berkman BE, Shapiro ZE, Eckstein L, et al. The ethics of large-scale genomic research. ethical reasoning in big data: An exploratory analysis. 2016:53-69.
13. Bittles AH, Hussain R. An analysis of consanguineous marriage in the Muslim population of India at regional and state levels. Ann Hum Biol. 2000;27(2):163-171.
14. Etchegary H, Cappelli M, Potter B, et al. Attitude and knowledge about genetics and genetic testing. Public Health Genomics. 2009;13(2):80-88.
15. Ma H. The path to personalized medicine. N Engl J Med. 2010;363:301-304.
16. Jackson L, Goldsmith L, O'Connor A, et al. Incidental findings in genetic research and clinical diagnostic tests: A systematic review. Am J Med Genet A. 2012;158(12):3159-3067.
17. Kapadia KM. Marriage and family in India. Indian Branch, Oxford University Press; 1955.
18. Kohane IS, Hsing M, Kong SW. Taxonomizing, sizing, and overcoming the incidentalome. Gene Med. 2012;14(4):399-404.
19. Majumder PP, Roy B, Banerjee S, et al. Human-specific insertion/ deletion polymorphisms in Indian populations and their possible evolutionary implications. Eur J Hum Genet. 1999;7(4):435-446.
20. Middleton A, Patch C, Wiggins J, et al. Position statement on opportunistic genomic screening from the association of genetic nurses and counsellors (UK and Ireland). Eur J Hum Genet. 2014;22(8):955-956.