

EVALUATION OF KNOWLEDGE OF INHERITANCE OF PATTERN OF INHERITANCE-SURVEY AMONG DENTAL STUDENTS

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Abstract

INTRODUCTION: Genetic inheritance happens because hereditary material, like DNA, is passed from generation to generation. At the point when creatures replicate, all the data for development, endurance, and multiplication for the cutting edge is found in the DNA passed down from the parentage genetic material, in the form of DNA, being passed from parents to their offspring.

MATERIALS AND METHODS: This was a prospective observational study. The advantages of the study were economical, easy to create, wide reach gathers large data and quick interpretation. The questions were circulated to the age group of 18 to 30 years and circulated among 100 undergraduate college students. The data obtained was analysed by Chisquare analysis using IBM SPSS software.

RESULTS AND DISCUSSION: On data analysis using spss, 78% of the participants are aware of who is the father of genetics, 22% of the participants are not aware who is the father of genetics. Among the population, 25% knew the law of dominance, 10.42% knew the law of independent assortment and 64.58% preferred all of the above. The results obtained were significant with p value of less than 0.05.

CONCLUSION: This present study concludes that the awareness of genetic inheritance among dental students is optimum and reliable. Programmes can be conducted to increase the awareness of inheritance by dental professionals among the general public.

KEYWORDS: Genetical inheritance, dominant trait, laws of inheritance, Innovative technique, hereditary

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INTRODUCTION

Genetic inheritance happens because of hereditary material, like DNA, being passed from guardians to their posterity. At the point when creatures replicate, all the data for development, endurance, and multiplication for the cutting edge is found in the DNA passed down from the parentage genetic material, in the form of DNA, being passed from parents to their offspring. When organisms reproduce, the DNA passed down from the parent generation incorporates all of the necessary knowledge for the next generation's existence, survival, and reproduction. Mendelian genetics is a type of biological inheritance that follows the standards initially proposed by Gregor Mendel. Mendel explained his results by describing two laws of inheritance that introduced the idea of dominant and recessive genes. The principles are summed up by the three laws the Law of Independent Assortment, Law of Dominance, and Law of Segregation.

In numerous nations, bioethics commissions talk about questionable parts of quality innovation, depicting a significant change in our comprehension of the idea of life and human personality. After the distribution of the human genome in the year 2000, hereditary qualities turned into a subject present in everyday life (Infante-Malachias *et al.*, 2010). There are more than 700 hereditary conditions with craniofacial peculiarities with many requiring complex dental treatments. A portion of these conditions are uncommon, for example, osteogenesis imperfecta and ectodermal dysplasia, while others, for example, nonsyndromic congenital fissure and sense of taste, are generally normal, influencing 4,000 infants every year in India (Wright and Hart, 2002) Additionally, numerous basic dental abnormalities, for example, hypo/hyperdontia, deferred or untimely emission of dentition, sporadic moulded teeth, polish/dentin dysplasia and malocclusion have a hereditary premise.

Oral wellbeing status has as of late been connected to various foundational conditions including diabetes and cardiovascular disease. Studies of these illness conditions recommend that different quality and quality climate corporations are important determinants of weakness (Slavkin and Santa Fe Group, 2014; Harsha and Brundha, 2017; Timothy, Samyuktha and Brundha, 2019). While there remains a lot to find out about the pathophysiology of these conditions, subatomic hereditary qualities are giving the information and instruments to characterize infections in cells. Notwithstanding the biological bits of knowledge acquired by investigations of hereditary infections, genomic research has expanded our comprehension of the atomic science of typical development and development. These advances are changing the speed and broadness of fundamental and clinical examination. The quick propels in our comprehension of hereditary qualities at the scientific level are probably going to yield critical commonsense applications for the analysis and treatment of clinical diseases(Sanger and Stewart, 1977; Brundha, Pathmashri and Sundari, 2019). The matching of genomic data and innovations have introduced the genomic time, in which assumptions are high that the use of genetic data will improve medical care in dramatic fashion(Diehl, 2006; Garcia, Kuska and Somerman, 2013; Shaffer *et al.*, 2013).

Experienced dental specialists refer to uncertainty, absence of confirmative exploration and defective testing strategies as motivation to bar hereditary testing from their practice. Regardless of studies affirming the legitimacy and significance of hereditary qualities in all parts of medication, dental experts have not fused hereditary assessment and testing into their norm of care (Sanger and Stewart, 1977; Gettig and Hart, 2003). Our team has extensive knowledge and research experience that has translate into high quality publications(Rao and Kumar, no date; Krishnan and Lakshmi, 2013; Devi and Gnanavel, 2014; Varghese *et al.*, 2015; Samuel *et al.*, 2019)(Kamisetty *et al.*, 2015; Patturaja and Pradeep, 2016; Felicita, 2017; Jain, 2017; Kumar, 2017)

By and large, there is an absence of data about dental hereditary qualities schooling and no known investigations that straightforwardly assess the information on human hereditary qualities in dental understudies, dental cleanliness understudies and dental inhabitants. Along these lines, it is vital to assess the knowledge of genetic inheritance among dental students.

MATERIALS AND METHODS

This was a prospective observational study. The advantages of the study were economical, easy to create, wide reach gathers large data and quick interpretation. The questions were circulated to the age group of 18 to 30 years and circulated among 100 undergraduate college students. The sampling method used in our study was simple random sampling. The questionnaire was a self-structured questionnaire administered through google forms to the participants. The approval of the study questionnaire was done by the Institutional Review Board of Saveetha Dental College and Hospitals, Chennai. Each output variable was collected as ordinal data and the collected data were represented as pie charts. A statistical test was done using the software SPSS version 23. The statistical test used chi square analysis and frequency percentage was calculated. The method of a representative of each output variable pie chart. The association between groups was assessed by the Chi-Square test where $p < 0.05$ was considered statistically significant.

RESULTS AND DISCUSSION

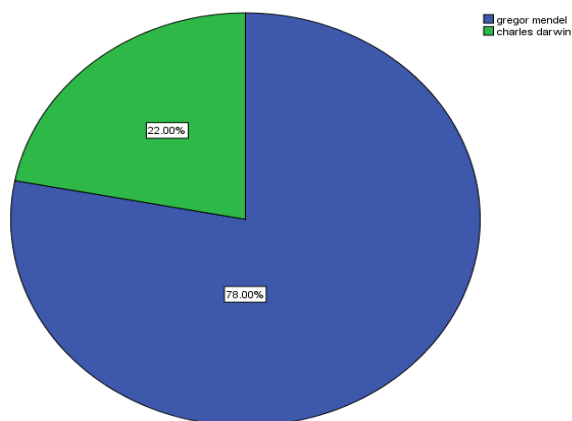


Fig 1: Pie Chart shows the awareness of the father genetics, 78% (blue colour)feel Gregor Mendel as father of genetics,22% (green colour) feel Charles darwin father of genetics

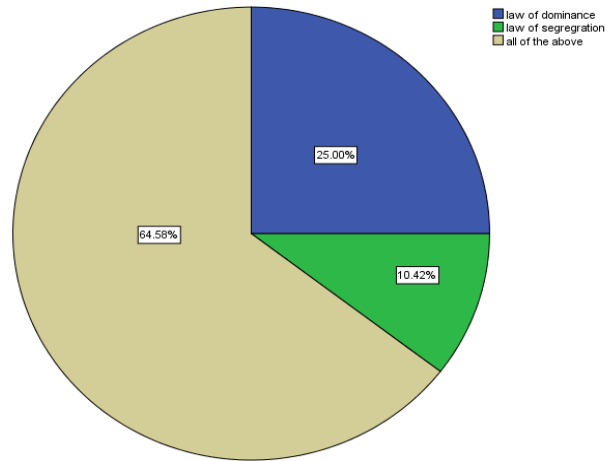


Fig 2: Pie Chart shows the awareness of the laws of Mendelian genetics , 25% (blue colour)knew the law of dominance,10.42%(green colour) knew the law of independent assortment and 64.58% preferred all of the above(beige colour).

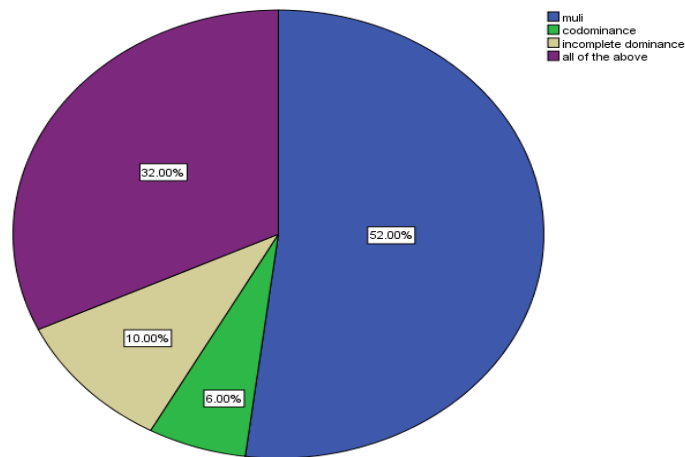


Fig 3: Pie Chart shows the awareness on the exceptions to Mendelian genetics, 52% (blue colour) feel multi is an exception,6%(green colour) feel codominance is an exception,10% feel (beige colour) incomplete dominance is an exception and 32% (purple colour)feel all the above options are exceptions.

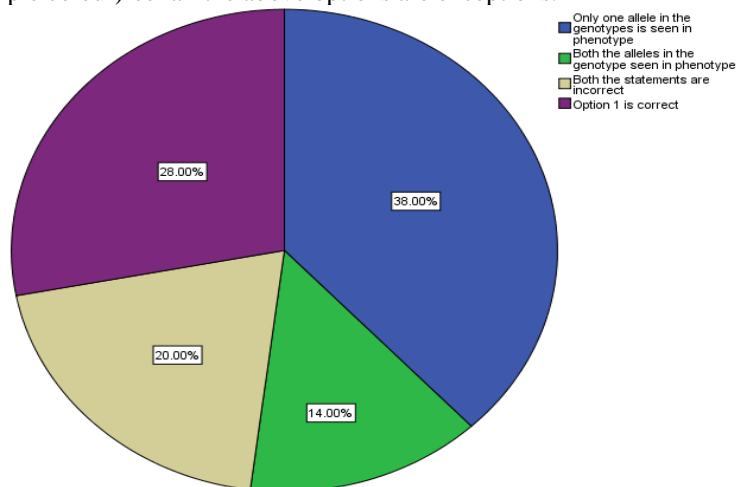


Fig 4: Pie Chart shows the awareness on a definition of codominance, 38% (blue colour) know the definition, 14% (green) don't know the definition, 20% (beige colour) feel both the options are incorrect and 28% (purple) feel option 1 is correct.

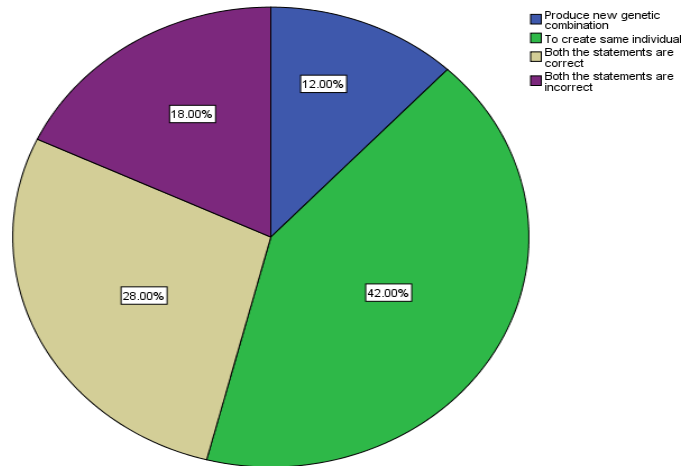


Fig 5: Pie Chart shows the awareness of the importance of the law of independent assortment, 42% (green colour) helps to create same individual, 12% (blue colour) helps to produce new genetic combination, 28% (beige colour) feel both the statements are correct and 18% (purple) feel both the statements are incorrect

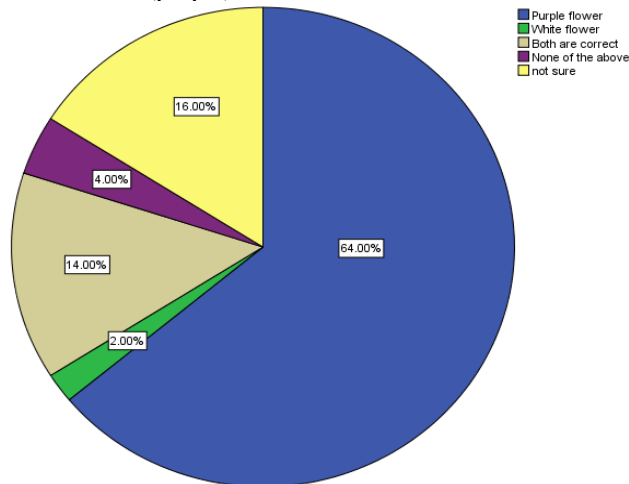


Fig 6: Pie Chart shows the awareness on the identification of dominant trait, 64% (blue colour) identified as a purple flower, 2% (green) identified as a green flower, 14% (beige colour) felt both are correct, 4% (purple) felt none of the above and 16% (yellow) are sure.

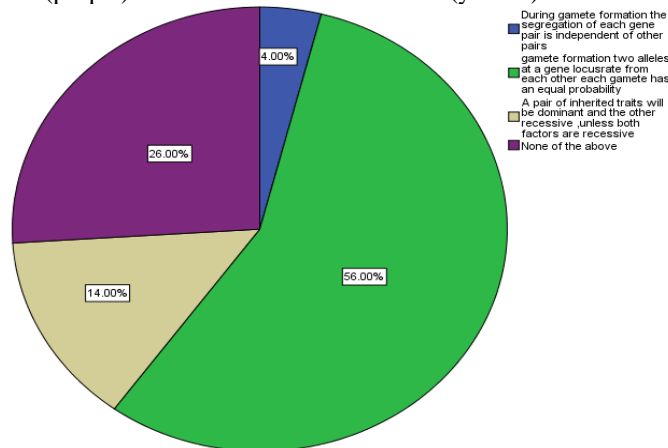


Fig 7: Pie Chart shows the awareness of what does the mendelian first law state. 56% (green colour) knew what the first law state,14% (beige colour) don't know what does the first law state,26% (purple) felt none of the above and 52% (blue colour) did not know what the first law states.

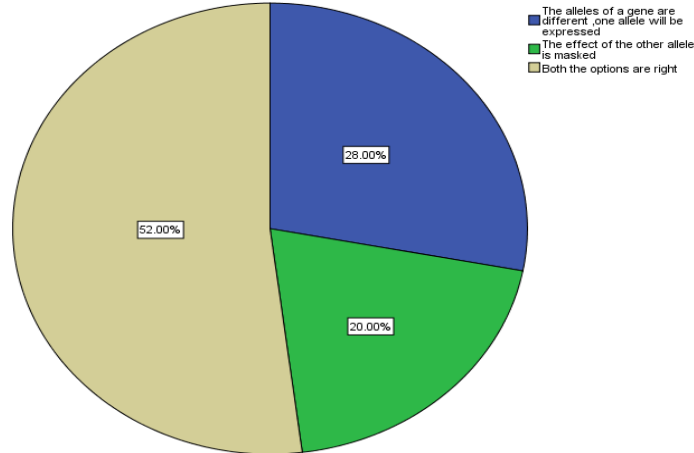


Fig 8: Pie Chart shows the awareness on the definition of dominant trait, 28% (blue colour) know to define dominant trait,20% (green colour) don't know to define dominant trait and 52% (beige colour) feel both the options re right.

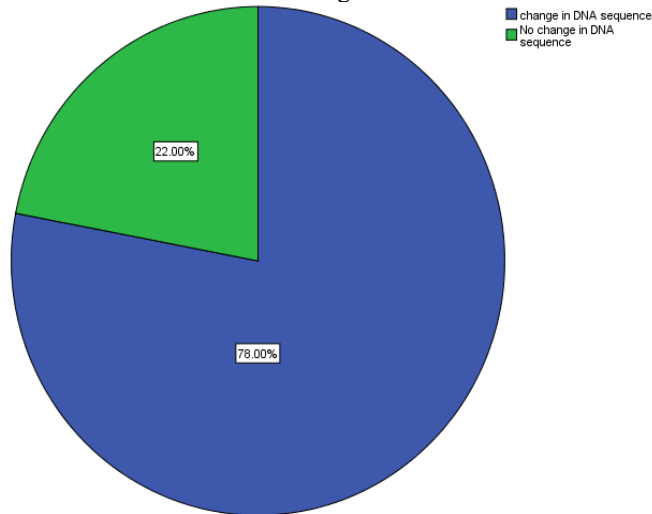


Fig 9: Pie Chart shows awareness on the definition of mutation , 78% (blue colour)know how to define mutation, 22%(green colour) don't know to define mutation.

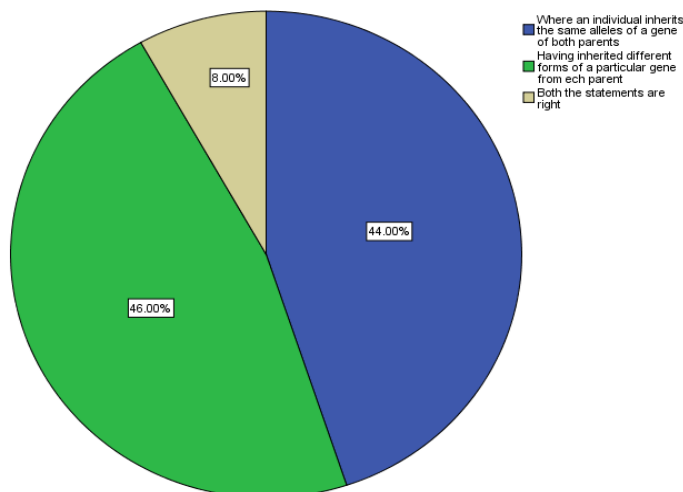


Fig 10: Pie Chart shows the awareness on the definition of the heterozygous individual ,44% (blue colour) know the definition of the heterozygous individual ,46% (green colour) don't know the definition of heterozygous individual and 8% (beige colour) feel both the statements are right.

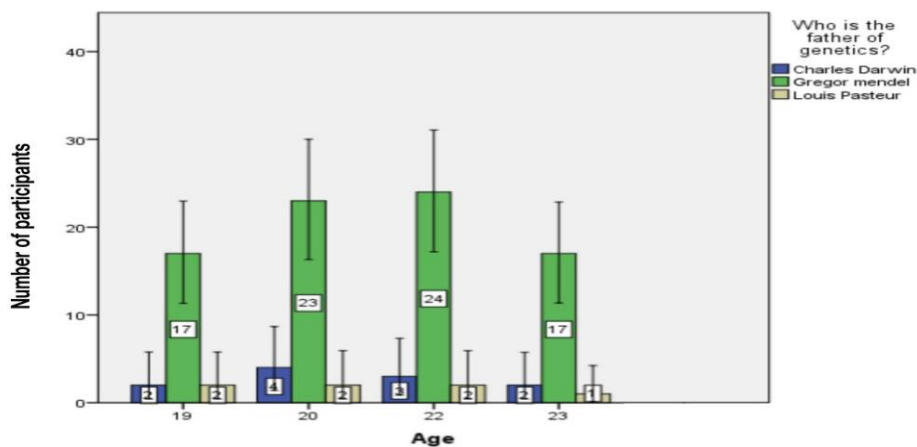


Fig 11: Bar graph representing the association between the age of the participants and the father of genetics. The X-axis represents the age of the participants and the Y-axis represents the number of responses. The green colour represents Charles Darwin and the blue colour represents Gregor Mendel. The majority of participants of the age group 20 years answered correctly as Gregor Mendel. Pearson's Chi-square value: 9.624, p-value- 0.211 ($p > 0.05$), hence statistically not significant.

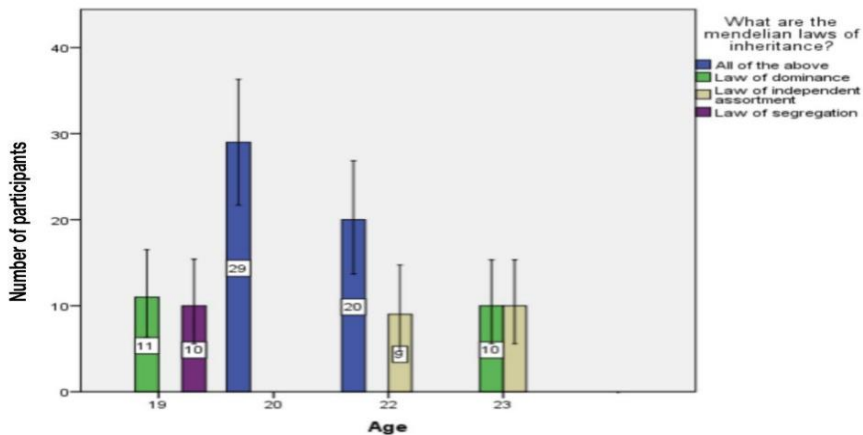


Fig 12: Bar graph representing the association between the age of the participants and the Mendelian laws of inheritance. The X-axis represents the age of the participants and the Y-axis represents the number of responses. The blue colour represents the law of dominance, green colour represents the law of segregation and the pale yellow represents all of the above. The majority of participants of the age group 20 years answered correctly as all of the above options. Pearson's Chi-square value: 17.231, p-value- 0.244 ($p > 0.05$), hence statistically not significant. k

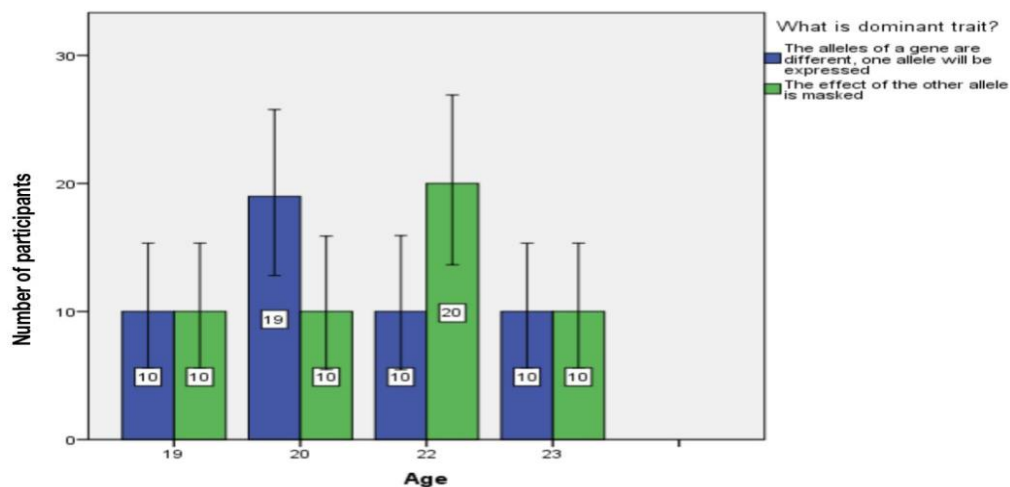


Fig 13: Bar graph representing the association between the age of the participants and the dominant trait. The X-axis represents the age of the participants and the Y-axis represents the number of responses. The green colour represents the effect of the other allele being masked and the blue colour represents the alleles of a gene are different, one allele will be expressed. The majority of participants of the age group 20 years answered both the options are right. Pearson's Chi-square value: 14.479, p-value- 0.415 ($p > 0.05$), hence statistically not significant.

On data analysis using descriptive statistics on SPSS version 23, 78% of the participants are aware of who is the father of genetics, 22% of the participants are not aware who is the father of genetics (Figure 1). Among the population, 25% knew the law of dominance, 10.42% knew the law of independent assortment and 64.58% preferred all of the above (Figure 2), Among the population, 32% feel codominance is an exception, 10% feel incomplete dominance is an exception, 6% feel muli is an exception and 52% feel muli (Figure 3). 38% know the definition, 14% don't know the definition, 20% feel both the options are incorrect and 28% feel option 1 is correct (Figure 4). 42% of participants feel it helps to create the same individual, 12% helps to produce new genetic combinations, 28% feel both the statements are correct and 18% feel both the statements are incorrect (Figure 5). 64% identified as a purple flower, 2% identified as a green flower, 14% felt both are correct, 4% felt none of the above and 16% are not sure (Figure 6), 56% knew what does the first law state, 14% don't know the what does the first law state, 26% felt none of the above and 52% did not know what the first law states (Figure 7). 28% know to define dominant trait, 20% don't know to define dominant trait and 52% feel both the options are right (Figure 8). 78% know how to define mutation, 22% don't know to define mutation (Figure 9). 44% know the definition of the heterozygous individual, 46% don't know the definition of heterozygous individual and 8% feel both the statements are right (Figure 10)

We have seen the association between age of participants (X-axis) and responses to awareness on the father of genetics (Figure 11), responses to awareness on the mendelian laws of inheritance (Figure 12), responses to awareness on a definition of a dominant trait (Figure 13). We have observed that the association between age and responses to awareness on the father of genetics was not statistically significant ($p = 0.211$) and an association between age and responses to awareness on the dominant trait was not statistically significant ($p = 0.415$).

Literature has brought up that most understudies from auxiliary school, after proper instructing, don't comprehend hereditary ideas and they can't portray the connection between some cell structures like chromosomes, DNA and qualities (Shaw *et al.*, 2008; Quinn, Pegg and Panizzon, 2009). In the previous study by Saka and associates (2006) have shown unmistakably that future instructors have insufficient understandings of the connection between some essential hereditary ideas (Saka *et al.*, 2006). Many addressed DNA, qualities and chromosomes as free constructions in a cell, attracting them inside the core and others the cytoplasm. An inquiry of the logical writing uncovers how the

commitment of hereditary variables to absent or deformed teeth, congenital fissure/sense of taste, oral malignant growth, caries, periodontal illness and other oral pathologies and conditions keeps on extending. The impacts that hereditary issues can have on a person's oral wellbeing are likewise notable. Dental specialists likewise need to have a comprehension of hereditary qualities. In excess of 3000 hereditary tests as of now, accessible include an assortment of hereditary sickness types. Most of these tests for Mendelian and cytogenetic conditions are clinically substantial and valuable; in any case, they should be utilized appropriately. As our comprehension of hereditary qualities and the part of hereditary variables in typical and unusual improvement builds, it is basic that dental understudies are shown something beyond Mendelian and cytogenetic issues. Dental specialists need to comprehend multifactorial conditions just as appreciate how ecological openness to microbial, viral, pharmacologic, diet, smoking, and different elements can influence the hereditary and epigenetic scene (Maradiegue *et al.*, 2005) This is especially valid for the dental consideration suppliers where smoking and the oral microbiome straightforwardly affect the advancement of caries, periodontal illnesses, and other oral pathologies.

The dental specialist has to realize where to go to search for hereditary assets. At the point when proper, the dental specialist ought to be important for the customized medication group. They should have the option to communicate in the language and comprehend fundamental ideas to associate with different individuals from the group in a significant manner. This absence of hereditary qualities training limits the dental specialist's capacity to connect with the bigger medical care group, further confining dentistry from other medical care disciplines. This segregation is bewildered by discrete medical care records and particular repayment frameworks (Regier and Hart, 2016)

In recent times, dental alumni ought to have the fundamental hereditary qualities information and abilities to give the instructive establishments comprehension and applying hereditary qualities to clinical practice. While the hereditary centre capabilities for such information, abilities, and mentalities should be produced for the dental calling, models have been created by others, incorporating suggested centre skills in hereditary qualities as far as wellbeing might be concerned experts (Harvey *et al.*, 2007) The disappointment of dental schools to consolidate human hereditary qualities into their educational programs is an inability to their understudies who will doubtlessly experience patients with hereditary issues in their training. Understudies without sufficient preparation in hereditary qualities won't be set up to viably analyze patients, assess new treatments or tests dependent on genomic data, nor work cooperatively with different individuals from the medical services group. Eventually, it will be the patients who endure. The limitations of this survey are less sample size and heterogeneous population. In further years, many upcoming surveys can be done using this survey as a base.

CONCLUSION

This present study concludes that the awareness of genetic inheritance among dental students is optimum and reliable. Programmes can be conducted to increase the awareness of inheritance among the dental students. Teaching curriculum may be modified to emphasis on the genetic inheritance and the diseases associated with it.

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CONFLICT OF INTEREST: The author declares that there were no conflicts of interests in the present study.

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