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## RATE OF GENOTYPE PARTICIPATIONS AMONG THE RESIDENTS IN KANO STATE METROPOLITAN AREA

Mustapha Usman Baba<sup>1</sup>, Abdulfatai Lawal<sup>2</sup>, Shamsuddeen Lawan Muhammad<sup>3</sup>

1. Department of Statistics School of Technology Kano State Polytechnic.
2. Department of Mathematics & Statistics Kaduna Polytechnic
3. A staff at Dangote Cement PLC & also a Student at Department of Statistics ADUSTECH Wudil Kano.

Corresponding email address: [mubstatistics@kanopolv.edu.ng](mailto:mubstatistics@kanopolv.edu.ng)

### Abstract

*The word genotype is the entire genetics constitution of an individual, i.e. the genetic makeup of an organism or group of organisms with references to single traits, set of trait, or an entire complex of traits. There are three hemoglobin genotypes (hemoglobin pairs/formations) in humans; AA, AS, SS. For this paper an attempt has been made to apply the chi square on some variables, and the other variables we used frequency and percentage, by adopting a questionnaire for obtaining information on the rate of genotype participation within Kano state metropolitan area. The data collected include the knowledge of genotype and participation in genotype test, the result obtained shows that there is significant relationship between knowledge about genotype test and genotype test participations 8.713 % and also there is significant relationship between genotype test participation and blood group test 49.532 % moreover there significant relationship between Genotype test participation before getting marriage and having carrier or sickle cell among the children 66.679% for chi square.*

**Key words:** Genotypes, Participation, Blood Group.

## INTRODUCTION

The word genotype is the entire genetics constitution of an individual, i.e. the genetic makeup of an organism or group of organisms with references to a single trait, set of traits, or an entire complex of traits. There are three hemoglobin genotypes (hemoglobin pairs/formations) in humans; AA, AS, SS. We all have a specific pair of these hemoglobins in our blood which we inherited from both parents. Also, Genotype determines the heredity potential and limitations of an individual from embryonic formation through adulthood. Among organisms that reproduce sexually, an individual's genotype comprises the entire complex of genes inherited from parent, it can be derived demonstrated mathematically that sexual reproduction virtually guarantees that each individuals will have a unique genotype (except for those individuals, such as identical twins, who are derived from the same fertilized egg) .It also refer to the alleles or variants of gene, which are carried by an organism. Humans are diploid organism, which means they have two alleles at a given locus, these alleles represent the genotype of a specific gene. Genotype along with epigenetics factors, determines the phenotype.

Genotype is internally coded inheritable information which is carried by all organisms. This coded information is used as a blueprint for building and maintaining a living creature. This information is present in all cells and is passed on to next generation at the time of cell division. These coded instruction control everything such as formation of protein, regulation of metabolism, in contrast to genotype, phenotype is the outward physical parts, energy utilization, tissues, organs, reflexes and behavior, therefore anything which is part of the observable structure, functions, or behavior of living organism can be a part of phenotype. Example of genotype include genes responsible for the stripes on cat, size of a bird's beak, height, hair color, eye color, etc.

The aim of the study is to find out the Rate of genotype participation among the resident in Kano state metropolitan area, so as to assess the level of participation and awareness in genotype test among the target population, and also determine the gender distribution for participation in genotype test among the target population, lastly to find out if there is any relationship between a person's genotype and the blood group. But the most important significant of this study is that, the outcomes of the research will highlight the level of awareness and participations of individuals in subjecting themselves for genotype test, this will help in curving the rise in sickle cells population in the society especially the target population.

## Material & Methods

This study aimed to assesses the rate genotype participation among the resident in Kano state metropolitan area. A descriptive survey research design was adopted and data were obtained from people of Kano state, the instrument that was used in collecting data for this study was a self-developed structured questionnaire.

## Study Area

The study was carried out in Kano municipal local government area of Kano state Nigeria, which is located within North West of Nigeria.

**Statistical Tools:** In this work a descriptive survey research design was adopted and data was collected primarily, the instrument that was used for data collection for the study was the self-developed structured questionnaire, and the descriptive frequency, percentages was computed and also the chi square was adopted to find the association between the independent variables in the study.

## Chi Square Test

Chi square is a statistical test used to examine the differences between categorical variables from a random sample in order to judge goodness of fit between expected and observed results. The chi square test is sensitive to sample size. Relationship may appear to be significant when they are not simply because a very large sample is used. In addition, chi square test cannot establish whether one variable has a causal relationship with another. It can only establish whether two variables are related in probability theory and statistics. The chi square distribution (also chi square or  $\chi^2$  distribution) with K degree of freedom is the distribution of sum of the square of K independent standard normal random variables. The chi squared distribution is a special case of gamma distribution and is one of the most widely used probability distribution in inferential statistic notably in hypothesis testing and construction of confidence intervals. This distribution is also called the central chi squared distribution; a special case of the more general non central chi squared distribution.

## Frequency and Percentage

Frequency and percentage statistics should be used to represent most personal information variables. However, if participants reported their exact age, then the mean and standard deviation should be calculated for the age variable. Frequency statistics should be reported whenever the data is discrete, meaning that there are separate categories that the participant can tick. For example, marital status can have categories of single, married, divorced, widowed, and separated. Educational qualifications can have categories of secondary school, diploma, degree, post-graduate diploma, masters, and doctorate.

Recall that a frequency is simply the number of participants who indicated that category. However, it is oftentimes difficult to interpret frequency distributions because the frequency by itself is meaningless unless there is a reference point to interpret the number. Percentage is calculated by taking the frequency in the category divided by the total number of participants and multiplying by 100%.

## Result and Discussion

**Table 1**

Gender distribution

GENDER	FREQUENCY	PERCENTAGE
Male	58	38.7%
Female	92	61.3%

From the above table, this shows us that 58 of the respondents are male which represent 38.7% and 92 are females which represent 61.3%.

**Table 2**

Residential area of the respondent

Residential area	Frequency	Percentage
Rural area	10	6.7%
Urban area	140	93.3%

From the above table, this shows that 140 of the respondent are from urban area which represents 93.3% while 10 are from rural area which represents 6.7%.

**Table 3**

Age distribution

Mean	30.77
Mode	30
Standard deviation	10.556

The above table presents the age distribution of the respondent with mean 30.77 and standard deviation 10.556, which indicates that the average age of the respondent is above 30 years

**Table 4**

Marital status of the respondent

Marital status	Frequency	Percentage
Married	69	46.0
Single	62	41.3
Divorce	19	12.6

The above table shows that 69 of the respondent are married which represent 46.0% and 62 are single which represent 41.3% and 19 are divorce which represent 12.6%.

**Table 5**

Status of premarital test in respect of genotype test before getting marriage

	Frequency	Percentage
Yes	38	25.3
No	50	33.3
Non applicable	62	41.3

This table shows that 41.3% of the respondents are non-applicable to the question while 33.3% answer no and 25.3% said yes.

**Table 6**

The mean distribution of the respondent children

Mean	6.42
Mode	9
Standard deviation	3.435

From the above table, the number of children of the respondents with mean 6.42 and standard deviation 3.435.

**Table 7**

Knowledge of genotype test of the respondents

	Frequency	Percentage
Yes	147	98.0%
No	3	2.0%

The above table shows us 98.0% of the respondents know about genotype test before getting marriage while 2.0% do not know.

**Table 8**

The distribution sources of information of genotype test for the respondents.

Source of information	Frequency	Percentage
Media	45	30.0
Hospital	45	30.0
Through friends	41	27.3
Marriage	16	10.7
Non applicable	3	2.0

This table shows us almost 30.0% knows the genotype test participations through hospital and media while the remaining through marriage and friends.

**Table 9**

Have you ever participated in genotype test?

	Frequency	Percentage
Yes	111	74.0
No	39	26.0

From this table we can say that 74.0% of the respondents have participated in genotype test while 26% haven't.

**Table 10**

Genotype status of the respondents to test if the participation in genotype test depends on the gender.

Genotype	Frequency	Percentage
AA	58	38.7
AS	46	30.7
SS	7	4.7
Non applicable	39	26.7

The above table shows that 58 of the respondents were AA which represent 38.7% and 46 are AS which represent 30.7% and 26.7% are non-applicable to the question.

**Table 11**

Did your wife ever participate in genotype test?

	Frequency	Percentage
Yes	54	36.0
No	16	10.7
Non applicable	80	53.3

From the above table we can say that 80 of the respondents are non-applicable which represent 53.3% and 54 answered yes which represent 36.0% and 16 answered no which represent 10.7.

**Table 12**

If yes, what is her genotype?

	Frequency	Percentage
AA	27	18.0
AS	26	17.3
SS	1	7
Non applicable	96	64.0

**Table 13**

Do you have carrier or sickle cell among your children?

	Frequency	Percentage
Yes	40	26.7
No	19	12.7
Non applicable	91	60.7

**Table 14**

How do you rate nowadays in your society about genotype test participation?

	Frequency	Percentage
High	38	25.3
Moderate	82	54.7
Low	19	12.7
Don't even care at all	11	7.3

The above table shows us the rate of genotype test participation is moderate that is 54.7%.

**Table 15**

Are your society familiar in participating genotype test?

	Frequency	Percentage
Yes	129	86.0
No	21	14.0

This table shows that 86.0% of their societies are well familiar in participating genotype test.

**Table 16**

In your society, between male and female, who are participating in genotype test?

	Frequency	Percentage
Male	27	18.0
Female	24	16.0
Both	99	66.0

From the above table this shows that 66.0 both male and female are more participating in genotype test.

**Table 17**

Blood group participation.

	Frequency	Percentage
Yes	116	77.3
No	34	22.7

This table show that 77.3% have participated in blood group test.

**Table 18**

**Blood group distribution.**

Blood group	Frequency	Percentage
A+	21	14.0
B+	25	16.7
AB+	15	10.0
O+	16	10.7

The above table shows that 25 of the respondents are B+ which represent 16.7% and 21 are A+ which represent 14.0.

**CHI SQUARE TEST OF ASSOCIATION BETWEEN SOME SELECTED INDEPENDENT VARIABLES**

**Table 19:** Association between gender and marital status

Variable	Chi square	P value
Gender and marital status	515.204	0.000***

From the above table, it shows that there is significant relationship or association between gender and marital status at 1% level of significance with the p value=0.000.

**Table 20:** Association between participations in genotype test and any other independent variables

Variables	Chi square	P value
Genotype test and blood group Test	49.532	0.002**
Participations in genotype test and blood group test participation	34.232	0.000***
Knowledge about genotype test and participation in genotype test	8.713	0.0003**
Genotype test participation before getting marriage and having sickle cell among the children	66.679	0.000***

The table shows that there is significant relationship between blood group and genotype test at 5% level of significance with p value =0.002, and also there is significant relationship between participations in genotype test and blood group at 1% level of significance, similarly the results indicate there is significant relationship between knowledge about genotype test and genotype test participation at 5% level of significance, on the other hand the results show that there is association between participation in genotype test before getting marriage and having sickle cell or carrier among children at 1% level of significance.

**Conclusion**

The finding of this study shows that there was high rate of genotype test participations among Kano state metropolitan area and this should be maintained. The major sources of the information among the respondents are the media (radio and television) and this enables respondents to know the importance of genotype test before getting marriage. Respondents



partner results contributed to the decision of the respondents thereby enabling them make informed decision concerning the safety of their future.

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