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RESEARCH ARTICLE

INHERITED AND ACQUIRED GENETIC DISEASES IN REGION 02 PHILIPPINES

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ABSTRACT

Background: With the advancements of health sector around the world, this study aims to compile the different genetic diseases present in Quirino and Isabela province in the Philippines in order to provide a knowledge to the community and prevent this genetic disorder in the future. Objectives: The objective of this research is to know the common genetic disorder present in the province of Isabela and Quirino, Philippines. **Methods:** The researcher use mixed methods of secondary data analysis or archival study and selective interview. The researcher saw that these methods fit because the researcher be requesting, from two random Rural Health Units (selected through fishbowl technique) per province in the region, a copy of their database or sheet on the genetic disorder cases in their places. Afterward, a structured interview will be administered to gather other necessary information that is not answered through the datasheet given. **Results:** There are 277 recorded cases of genetic diseases and disorders here in the region. 81 of which are acquired and 196 are inherited. Of the 277 cases, 166 are from Isabela and the remaining are from 111 Quirino. The number one case in Isabela is diabetes and learning disability from Quirino. When the data from the two provinces are combined, the highest case goes to cleft palate which is also the top 2 numerous cases of Isabela and top 3 of Quirino. **Conclusions:** This growing number of cases are mainly due to the lack of funding and shortage of geneticists in our country. Another contributory part is the lack of knowledge on prenatal care of some parents in the region. Unfortunately, some of them conceived a child with genetic alteration because of one of the following: Improper medication (hilot), Menopausal baby, Parents are both cousin, Unhealthy work environment, Lack of nutrition

INTRODUCTION

Genetics is one of the most important biological sciences that has a direct effect on us. It didn't just help us learn and understand that most of our characteristics are passed down from our parents but it also tells us that any alteration from our normal DNA may contribute to disease formation - these diseases are called genetic disorders or genetic diseases. In the Philippines, genetic disorders and diseases are the third leading causes of death in the natality period. This may be seen as a result of little to no attention given to genetic complications in infants. When we talk about genetics, the Philippines is revered to be one of the active countries in Southeast Asia. It was somehow a surprising and confusing fact since our country only has a small number of geneticists and genetic counselors.

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This problem is being aggravated by very low budget allocation on our health sector in comparison to our neighboring countries. In addition to these, there are no formal national surveys or registries on genetic disorders in our country. Because of this very premise, there were no properly organized projects and programs to support the needs of the people who are suffering from genetic disorders. That is why the researchers are pushing this study - to collect data about the genetic diseases in region 2, more specifically Isabela and Quirino provinces; categorize these diseases as either inherited or acquired; produce an infographic showing the numerical data about the genetic diseases in the region, and to formulate suggestive programs and projects that the researchers believe will somehow solve some of the problems of the people who are living with a genetic alteration.

MATERIALS AND METHODS

Design: The researcher uses mixed methods of secondary data analysis or archival study and selective interview. The researcher saw that these methods fit because the researcher be

requesting, from two random Rural Health Units (selected through fishbowl technique) per province in the region, a copy of their database or sheet on the genetic disorder cases in their places. Afterward, a structured interview will be administered to gather other necessary information that is not answered through the datasheet given..

Environment: The study is conducted in the province of Quirino and Isabela. This place was specifically chosen because the researcher want to know the percentage of how many genetic disorders are acquired and inherited. From this data, the local government units or even the provincial governments in the region can curate projects or programs that are in line with the results of this study.

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Samples and Sampling Procedure: The respondents of this research are the four Rural Health Units, two from each of the provinces of Isabela and Quirino. We also included the Municipal Social Welfare and Development Offices in the respected places where we gathered our data.

Instrumentation/data gathering: In this study, the researcher requested adata sheet on the cases of genetic disorders in the different RHUs and DSWDs in the province of Quirino and Isabela. Data that will not be acquired through the datasheet will be gathered through a structured interview form.

Treatment of Data: To determine the percentage of how many genetic disorders are acquired and inherited Paired T-Test will be utilized. This particular test is chosen because according to the University of Minnesota, Module 5 – Data Analysis, Types of Statistical Tests Paired T-Test will test for the difference between two variables (in this case: inherited and acquired) from the same population which is Region 02. The comparison of the means test will be conducted through the IBM SPSS program.

RESULTS

The population of region 2 with genetic diseases, in particular the province of Isabela and Quirino. The population was then categorized into two: acquired and inherited. Based on the data that the researcher has gathered, there are a grand total of 277 recorded people who have genetic diseases and disorders. 196 of which, inherited their genetic alteration from their parents and the other 81 got theirs through lifestyle, environment around them, and other factors. Of the 277 recorded population, 166 resides in Isabela and the remaining 111 are from Quirino. The large gap between the two could be correlated with the size of the two provinces. Isabela being the largest province in the country could be forgiven having also the larger number of the two provinces who participated in this research. The genetic disorders identified in the province of Isabela. The following are those disorders: G6PD, deformity, speech impairment, orthopedic impairment, cerebral palsy, leukemia, learning disability, hyperthyroidism, diabetes, lymphoma, epilepsy, down syndrome, autism, hearing impairment, and cleft palate. The data shows that genetic disease that dominates the health community in Isabela is diabetes with an occurrence of 17%, two percent higher than the second genetic disease which is the cleft palate at 15%; the third is at 9% which is the learning disability that is somehow associated with genes and its development.Of the listed genetic diseases in the province of Isabela, the lowest were the cerebral palsy and epilepsy which both have an occurrence of 3%. The genetic disorders identified in the province of Quirino. The following are those disorders: epilepsy, autism, learning disability, hydrocephalus, hearing impairment, down syndrome, leukemia, hunchback, visual impaired, cardio vascular, lymphoma, orthopedically impaired, cleft palate, deformity, and systemic lupus, and cerebral palsy.

Table 1. Population of Region 2 Participants

Provinces	Genetic Diseases		Total
	Acquired	**Inherited**	
Isabela	52	114	166
Quirino	29	82	111
Total	81	196	277

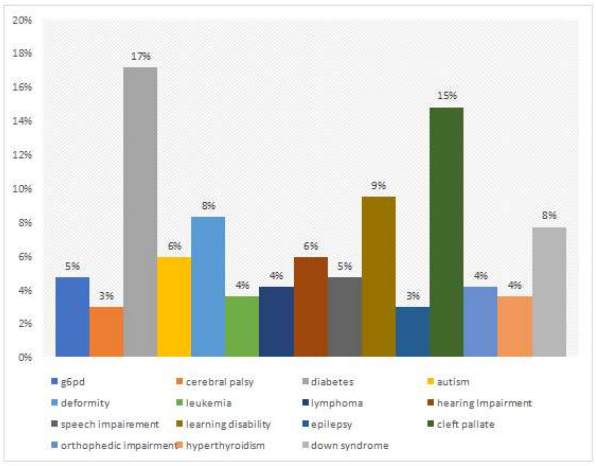
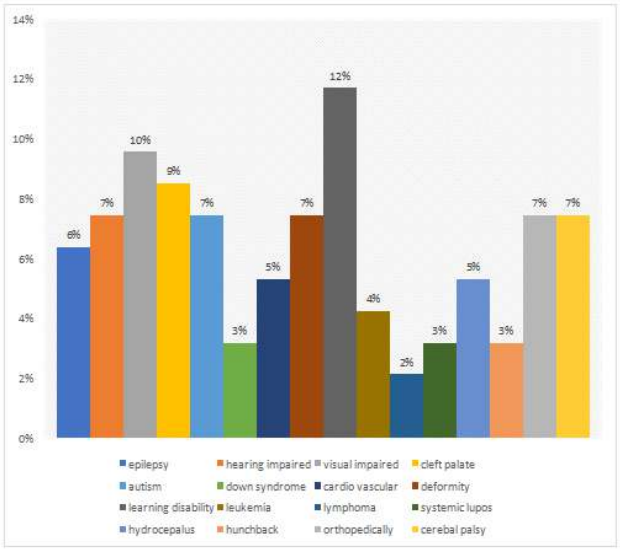


Figure 1. The genetic disorders in the Quirino province



The genetic disease that dominates the health community in Quirino is learning disability with an occurrence of 12%, two percent higher than the second genetic disease which is visual impairment at 10%; the third is at 9% which is cleft palate. Of the listed genetic diseases in the province of Quirino, the lowest was lymphoma with an occurrence of 2%. And lastly the genetic disorders identified in region 2, more specifically in Isabela and Quirino. The following are those disorders: G6PD, deformity, speech impairment, orthopedic impairment, hydrocephalus, cerebral palsy, leukemia, learning disability, hyperthyroidism, systemic lupus, diabetes, lymphoma, epilepsy, down syndrome, cardiovascular, autism, hearing impairment, cleft palate, hunchback, and visual impairment.

Table 2. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
INHERITED	Equal variances assumed	1.486	.231	-2.061	33	.047	-3.50000	1.69786	-6.95432	-.04568
	Equal variances not assumed			-1.971	24.520	.060	-3.50000	1.77615	-7.16168	.16168
ACQUIRED	Equal variances assumed	8.135	.007	-2.062	33	.047	-2.01667	.97824	-4.00692	-.02641
	Equal variances not assumed			-1.843	16.935	.083	-2.01667	1.09429	-4.32609	.29276

The genetic disease that dominates the health community in region 2 is cleft palate with an occurrence of 12.54%; the second genetic disease is diabetes at 11.02%; the third is at 10.26% which is learning disability. Of the listed genetic diseases in the region, the lowest were hunchback and systemic lupus with an occurrence of 1.14%. The result on under the Levene's Test for Equality of Variances, under the Significant Difference, you can see that the value is 0.231 which is definitely higher than 0.05. This simply means that there is no significant difference between Isabela and Quirino in terms of Inherited Genetic Diseases (IGD). Aside from this, having a Sig. value higher than 0.05 will mean that we need to read the higher part of the row. The Sig. (2-tailed) value of the Inherited diseases is 0.047 which is higher than 0.02 which further confirms that there is really no statistically significant difference between Isabela and Quirino in terms of IGD. Looking at the row of the Acquired, under the Levene's Test for Equality of Variances, under the Significant Difference, you can see that the value is 0.007 which is definitely lower than 0.05. This simply means that there is a significant difference between Isabela and Quirino in terms of AGD.

DISCUSSION

The study wants to find the current status of genetic disorders in region 2. As the data of the previous year shows, the number of natality rate of newborn born babies in the previous year are increasing and one of the reasons for this is related to genetic disorder that is being ignored due to lack of geneticist and medical apparatuses for screening the genetic disorder. Because of these situations we are in, we decided to figure out ways on how we can prevent or improve this situation in the region. In order to come up with a solution to this dilemma, the researchers collect the data on genetic disorders in the region; particularly in Isabela and Quirino provinces. The researchers came up with a plan to generate a program to lessen the natality rate related to genetic disorders. The formulated programs will then provide solutions to the problems faced by the newborn or the PWD with a genetic disorder. For the further support of this study, the researcher looked into different studies that might offer help and lay foundation in conducting this paper. In this part you will see the similarities and differences of this paper to the related studies presented above. Such as the study of Carmencita David Padilla and Eva Maria Cutionco-de la Paz geneticservices and testing in the Philippines. This research determined the different genetic services and testing in the past. It was found out, through qualitative method and records and documents collection analysis, that in the past, services and testing genetics in the Philippines is very lacking due to many factors. Another one is the study also of Carmencita D. Padilla, birth defects ascertainment in the Philippines.

This paper looked at genetic diseases and disorders at a very specific angle – the infants as victims of DNA alteration. It was reiterated that these rare diseases are the top three cause of death in the natality period. It was also revealed how many times different institutions tried to register as much as possible people with genetic diseases and disorders and that they have failed in attaining a fruitful end. Another study of Carmencita D. Padilla and Eva Marua in Genetics and genomic medicine in the Philippines shows that there are shortage of geneticists and genetic counselors in the country; and it shows the revelation that there are difficulties for research and integration of the health care services into the public health due to limited resources. To be honest, there are no major differences between the literatures that we have written here. Aside from the level of research and the targeted objectives, the results are almost always the same, especially those researches conducted here in the Philippines by Carmencita David Padilla and Eva Maria Cutionco-de la Paz. The researches all pointed out that mutation or any alteration in the DNA of a human being may lead or contribute to diseases which we call as genetic diseases and disorders. In addition to this, another key player that contributes to the formation of these rare diseases is the lifestyle or the environment of the person. In particular, the researches local here in the Philippines are quite disappointing as upon carefully reading and studying it conclude that our health care system is slowly deteriorating and the courses that has something to do with medical genetics are not that popular nor enticing to take for college freshmen. The problems in our health care system, specifically in the division of genetics, ultimately boil down to the lack of funding of our government in the health sector of our country. As a result, there are only few geneticists in the country. This problem echoes in the national scene as genetic diseases and disorders become one of the top three ailments that claim the lives of infants in the country. With these, this research would like to be added to the few roster of researches in the country that calls out our government with their poor response to these dilemmas that we inherited from the past administrators of our country. The only hope of the researchers is to improve the situation of the people who are facing this problem and to prevent them, if we can, from ever happening again through scientific advancements and medical support.

CONCLUSION

In conclusion, with the number of genetic disorders is present in the community specially in the Quirino and Isabela province it proves that the local people has a least knowledge in genetic diseases resulting to adifferent abnormality in the child when born. This is quite alarming specially to the people who are still practicing different superstitious belief which is one of the causes of genetic disorder as the findings say. with this study

may give awareness to the people about genetic disorder to prevent a future suffering to their child.

CONFLICT OF INTEREST STATEMENT

The author declares that there's no conflict-of-interest present in this study, its respondents, and its researcher. Funding was provided by the Department of Science and Technology through scholarship program. However, the declaration of no conflict of interest still stands since publication of a research is a core requirement in the author's graduate degree.

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This study was funded by the DOST through the CBPSME.

Glossary of Abbreviations

CBPSME: Capacity Building Program for Science and Mathematics Education
COVID-19: Corona Virus Disease 2019
DOST: Department of Science and Technology
RHU: Rural Health Unit
DSWD: Department of Social Welfare and Development

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