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Malnutrition

Stunting caused by undernutrition in preschoolers of the Buhid Mangyan Tribe in Occidental Mindoro, Philippines

The Philippines, an island country, is located in Southeast Asia, in the occidental Pacific Ocean. Its land consists of 300,000,000 km² and is divided into 7000 islands, although only 11 are inhabited and considered its main provinces (BBC News, 2022). The Philippines' estimated population is around 114,755,000 million people (Borlaza, G. C., 2023). Occidental Mindoro is a province inside the MIMAROPA region, inhabited by around 525,354 people, where the region represents 16.27% of the population. 36.61% of its people consist of the young dependent population, that is to say, those under the age of 14 (*Occidental Mindoro Profile – PhilAtlas*, 2023). One of the communities found in Occidental Mindoro is the Buhid Mangyan Tribe (a community in the municipality of Rizal).

Before stepping into the particularities of undernutrition presented on the Buhid Mangyan Tribe, overall, the Philippines is a country that has always struggled with undernutrition. A survey conducted by the National Nutrition Survey (NNS) of the Food and Nutrition Research Institute of the Department of Science and Technology located in Taguig, Philippines, in 2015, reported that the country presents a severe conflict with undernutrition in children, characterized by deficiency of elemental nutrients for child development such as Vitamin A, iodine, and iron. The survey also showed that this country has a concerning amount of 31% of families that have some sort of issue with providing food to their families and suffer from hunger (equal to almost 7 million families). It was also shown that 69% of households do not meet the healthy/recommended energy intake on a daily basis (García, 2013). The country was ranked as one of the top 10 countries with the highest numbers of stunted children worldwide and also as a part of the top 5 among East Asia countries (Acayan, E. & World Bank Group., 2023). To understand the extent of these numbers, we should remember that its estimated population is quite large.

Occidental Mindoro is known as one of the regions within the Philippines, that covers a significant portion of the country's undernutrition rates, and according to the same survey mentioned before, the prevalence of undernutrition among toddlers (ages 1 - 3) and preschoolers (ages 3 - 5), in Occidental Mindoro data presents that 40.3% of preschoolers are underweight and 53.9% present stunting (Republic of the Philippines National Nutrition Council., 2020). Almost two years later, a more specialized questionnaire was conducted in the Municipality of Rizal to determine the status of nutrition of toddlers and preschoolers, and the reflection of the feeding practices provided by those responsible for them, centering in the Buhid Mangyan Tribe.

The information extracted from the participants of the study was mainly provided by the parents or guardians of the 53 children taken into account; their habits regarding their feeding patterns (type of food ingested, consistency with which they are fed), and anthropometric assessments, however, this document will only retrieve the necessary things to know about the study and the direct indications of malnutrition provided by it. The following table will demonstrate the number of toddlers brought in from their age to the percentage of their participation in the study.

Table 1. Simplified profile of the toddler/preschooler participation according to their age, number, and percentage of them to contrast their involvement in the questionnaire.

Age (in months)	Number of toddlers/preschoolers	Percentage of toddlers/preschoolers
6 to 17	14	26.4%
18 to 29	22	41.5%
30 to 41	12	22.6%
42 to 53	1	1.9%
54 to 59	4	7.5%

Data retrieved from Gonzales, A. (2021). *Nutritional Status and Infant and Young Child Feeding (IYCF) Practices among Buhid Mangyan Tribe, Occidental Mindoro Philippines*. Research Gate.

The next table is a simplified version of the resources found in the study, based on the prevalence of underweight, and stunting, obtained within 51 to 53 candidates.

Table 2. Prevalence of underweight weight for age scores and stunting candidates based on height for age.

Prevalence	Number of candidates	Percentage of candidates
Weight for age underweight (53 candidates)		
Prevalence of moderate underweight	12	22.6%
Prevalence of severely underweight	8	15.1%
Height for age stunting (51 candidates)		
Prevalence of moderate stunting	10	19.4%
Prevalence of severe stunting	18	35.3%

Data retrieved from Gonzales, A. (2021). *Nutritional Status and Infant and Young Child Feeding (IYCF) Practices among Buhid Mangyan Tribe, Occidental Mindoro Philippines*. Research Gate.

The most important thing to reclaim and the interpretations that can be extracted from these couple of facts⁶ is that not only did these studies expose the inappropriate feeding practices of the tribe, but also raised concerns about stunting children in the community. When contrasted according to World Health Organization (WHO) standards, it was shown that more than half of these children are stunted and that there is a clear prevalence of underweight toddlers, far worse than both, the national rate and the MIMAROPA region (19.9% and 25%).

However, we should know that these problems related to nutrition and dietitian choices have to do with every family's economic situation and the education provided about proper healthcare, healthy food choices, and overall educational strategies to tackle hunger in the country. It happens to also be related to poor exposure to appropriate feeding practices by the communities surrounding the area.

The danger regarding food insecurity is threatening to everyone, both producers and consumers. In the case of consumers, it is progressively getting harder to afford healthy and balanced diets for everyone, and crop shortages limit access to provide food for all people; In the case of producers, the elements needed to keep producing all sorts of products and crops are also increasing the price, which obligates them to increase the value of what they produce, and in many cases makes them unable to keep producing (Bicker & Rivera, 2022).

There are sectors established within the country, where these programs are needed the most, like for instance, the Buhid Mangyan Tribe. They focus on implementing educational initiatives to educate children and families about the importance of proper meal planning and healthy habits. Occidental Mindoro is starting to implement diverse programs like the ECCD-F1K Program (Early Childhood Care and Development for the First 1000 Days), which consists of prioritizing the first 1000 days of life with the best nutritional attention possible. The program mainly addresses nutrition during pregnancy, the breastfeeding stage, and follow-up with infant nutrition.

This program is a great opportunity to pay attention to the main risk factors that may cause malnutrition and stunting derived from it, especially after reviewing the Buhid Tribe case. The solution relies not only on monitoring the feeding patterns the community follows but also, the thing about these types of programs is that most of them are attempted to be applied to large dwellers. This is why most of them happen to progress slowly or never actually work. However, when it comes to a smaller part of the population, it is way easier and efficient to focalize its objectives on the communities found in smaller sectors.

According to the FAO, dietary guidelines dictate that the Philippines' diet is mostly based on carbohydrates such as rice and protein extracted from mostly, seafood (fish, seaweed, oysters, etc.) However, the suggestions are to balance ingesting all sorts of foods and incorporate them into a daily diet. Such recommendations include vegetables, fruits, meat, and fiber to fulfill elemental nutrients. The conditions may not be the most favorable for vulnerable communities, but a new program that is able

to help them work with whatever situation they've got going on will teach them new ways to survive without endangering their health and development.

My main solution is focused on creating an educational program in schools located around the Buhid Mangyan Tribe, where preschoolers can start getting involved in their nutrition process as they eventually will be able to start noticing the elements needed for them to be healthy and properly nourished.

For this matter, I would like to implement a program inviting the University of Rizal System - Tanay Campus to add it as a possible social service for undergraduate students. The reason why this university is a good choice for the project is that it offers a wider range of nutrition-related career paths in comparison to the majority of other universities in the municipality. The Bachelor's programs offered by it include a career in Agricultural Technology with majors in animal and crop production, a career in Agriculture offers majors in agronomy, crop protection, and horticulture, and lastly, a career in Secondary Education, where one of the majors include Technology and Livelihood Education (*University of Rizal System - Tanay Campus: Bachelor's Programs Offered*, n.d.). Additionally, this educational facility is located in the same municipality as the Buhid Mangyan Tribe, which allows ease in geographical proximity and contact between the tribe and the institution.

These career majors may be able to provide a wider perspective on taking care and advantage of the resources that are produced, options for low-income families, and other types of nutritious resources other than the usual meat, vegetable, and fruit, for those in the communities that may be struggling to gain back weight or to level out the needed nutrients for their bodies, with other assets such as supplements or even herbal remedies. My proposal recommends last year undergraduate students as the choice for this project because they are knowledgeable enough to fully develop the project, and grants an opportunity to gain experience with working with other people. Another reason has to do with the proximity to this community. Working with people who can also make mistakes when working, makes the experience more relatable for the members of the community who might be having a hard time keeping up with implementing new lifestyle changes.

The first phase incorporates a survey system. It would allow the undergraduate students to get a first glance at the community that they are going to be working with, in the following phases. These surveys would evaluate the extent to which the community struggles to follow appropriate feeding practices, eventually damaging the toddler/preschooler's physical development; the conditions the community lives in like economic position, accessibility to resources, and a particular destination that may present hardships in food security like vulnerable sectors of the municipality. This is the first approach to the community and the survey would allow modifications in the other phases (according to the results obtained from the survey) to fit the needs and priorities of the community that is being worked on and strengthen the program itself for better results in their health improvements, as to also detect its deficiencies and opportunity areas.

On the other hand, the second phase suggests that students who participate could lecture families around the municipality of Rizal about options to take care of their nutritional needs. I can think of three possible ways to provide new resources that become useful regarding the nutritional status and that will be able to give more personalized attention to the community. The first one consists of offering courses of guidance for families around the community to build healthier habits (adequate portions of each meal, and properly balancing the elements inside a meal, like for example, a meal where you can find the recommended intake of protein, carbohydrates, lipids, and minerals mainly). It suggests basic information on what the intake of food should look like for different ages and attempts to modify unhealthy habits as long as those changes don't go against their cultural/traditional values or preferences.

Lastly, the third phase of the program would suggest different ways to use the available resources of the community to maintain a somewhat healthy balance in the ingestion of the necessary nutrients. The program would be designed to teach family members to work their way around the budget that is available for food, by recommending different ways to cook with cheaper alternatives or simply cook the groceries with which each family is provided according to their accessibility to those ingredients. This aspect is extremely important because one of the main reasons why these communities encounter undernutrition is not only caused by their lack of

knowledge on proper nutrition, but also because of food insecurity. An example of the issue is that every year, the stocking price of the available crops increases, which makes it even more difficult for the whole nation to find or afford food resources.

The alternatives showcased by the program will give the community a way to move into a viable option for their specific needs. The third phase would also include an option to build a small home garden with only one type of crop that does not require much budget and is considered a home-friendly option. This crop would be eggplant. First and foremost, eggplants have great nutritional value, working as a source of lots of vitamins and minerals such as vitamins A, K, B6, and C, magnesium, phosphorus, fiber, copper, potassium, iodine, and others (Watson, 2019) & (Diamond, 2018). Secondly, eggplants are crops that need warm weather, needing at least 50°F to grow, and considering that the Philippines weather is usually around 27°C to 19°C (World Bank Climate Change Knowledge Portal., 2020), makes it a perfect crop for the weather in the nation. Eggplants can be placed indoors, although it is suggested to plant them outside (even if it is a small fertile space), as long as they are fully exposed to the sun, will need to be watered 1 to 3 times per week and can be harvested from 80 to 100 days after transplantation (Finley, 2020). The crop suggestion is not only going to be useful while fighting undernutrition (especially toddlers and preschoolers) but it is one affordable and efficient option.

Some limitations for school systems to implement a program like this, is that perhaps the community doesn't notice the extent of undernutrition because it is not a priority to build healthier lifestyles. Their main difficulties revolve around money, and because it is a dependent factor for a healthier lifestyle, the need for economic stability becomes the main concern. However, attracting and stressing the importance of a balanced diet and the proposal to the community might demonstrate its benefits for every family. The participation of regular citizens also plays a crucial role, because the program is made for them. Their participation in distributing the proposal within the community allows it to reach new people. Newcomers help modify the program to fit every family's struggles, so promoting the program not only in schools, but with a simple chat between members of the community helps the proposal to expand its ways to help people.

Another solution that also includes crops as the main resource is a community garden. To be quite frank, this may not be the best option for this specific community. Keeping up with building and maintaining a community garden is not as affordable considering their income. Interestingly enough, the Buhid Mangyan Tribe mostly works as farmers of crops like rice and garlic (Ferdz, 2009), so the experience in maintaining crops is there. This raises the question of why, as farmer communities, their access to food is so restricted, and how this issue aggravates undernutrition within the community. They have to sell what they produce, and still, do not ensure a stable income for their families. The monthly income for poor families in the Philippines is under PHP 9100 (equal to 160.58 USD approximately) (Divina, 2023). Then, the average number of people in a Filipino household is of 4.1 people ("Average Household Size in Philippines," 2023), which means that (if distributed equally), each family member has around 39.17 USD to spend for an entire month, making it difficult to comply with their normal needs, and considering this is their highest income as poor people, the number tightens up for families under this number.

Retaking the community garden proposal, perhaps the community might not be able to finance it, but a solution to this is to get a sponsor or an organization involved. The reason why I am suggesting it is because it allows the whole community to share resources and it can be non-commercial, which alleviates the pressure of having to sell everything and assures fresh food strictly for their consumption. It also gives the community a chance to expand their food choices and encourages them to share a space where anyone can be involved. It would take time to properly grow each crop, but it would be worth the effort, and keep their customs of hard work intact.

Building and growing a community garden is multifactorial. It will depend on the size of the garden, types of crops, the structure of the facilities chosen with available water and electricity, maintenance, and even depend on the weather, which is out of the community's control and can become pricey, especially when having a very tight budget (Goodall, 2010). But a couple of solutions to reduce the costs of having a community garden can be:

- Recollecting reusable materials such as plastic, or old furniture (wood); and giving them new use to build pots, divisions between crops, or even protection from aggressive sunlight and abundant rain.
- Getting people to volunteer. This makes it unnecessary to hire people and spend too much money on paying. Since the general community struggles financially, hiring isn't viable for this.
- Getting a sponsor to finance the garden. The input of an institution or a common sponsor will take most of the concerns of expensive fees, in terms of money. Then, the community could focus on growing their crops and will partially stop worrying about food accessibility.

This solution does not guarantee complete control over proper nutrition in the community, but it at least, gives them a chance to find resources and slowly change their unhealthy habits into healthier balances.

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