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Original Article

Newborn Screening Program at the Rural Health Units in Zamboanga City: An Assessment

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Abstract *- This study primarily assessed the implementation of the Newborn Screening Program in selected Rural Health Units in Zmboanga City, Philippines.*
It is a Descriptive, Retrospective Study using Quantitative-Qualitative techniques. It was conducted in 2019 before the start of the COVID 19 pandemic.

A guided questionnaire for the parent respondents and an interview guide for the health personnel were utilized. Analysis of data was done through the use of Descriptive Statistics.

Generally, the parents have a good understanding of Newborn Screening (73%), except for the different newborn conditions, where only 50% of the parents understand and are familiar with the different newborn disorders.

Newborn screening is done routinely for deliveries in a facility-based clinic and home deliveries. Newborn disorders such as Congenital Hypothyroidism and G6PD Deficiency are diagnosed, and protocols for proper referrals and management are done by the health personnel in the Rural Health Units (RHUs).

Newborns with a positive result are recalled for confirmatory testing as soon as possible and are referred for treatment and management to a medical specialist.

Keywords *- Newborn Screening, Assessment, Retrospective Study, Zamboanga City.*

1. Introduction

Newborn screening (NBS) is a public program aimed at the early identification of infants affected by certain genetic/metabolic/infectious conditions. Early identification and timely intervention can reduce morbidity, mortality, and associated disabilities in affected infants. Newborn Screening in the Philippines started in June 1996 and was integrated into the public health delivery system with the enactment of the Newborn Screening Act of 2004 (Republic Act 9288). From 1996 to December 2010, the program saved 45,283 patients. Five conditions were initially screened: Congenital Hypothyroidism, Congenital Adrenal Hyperplasia, Phenylketonuria, Galactosemia, and Glucose-6- Phosphate Dehydrogenase Deficiency. (Department of Health).

The advancement of newborn screening in developed countries has reduced morbidity and mortality associated with certain congenital disorders. Screening within the first few days after birth allows timely medical intervention for the diagnostic patient resulting in more favorable outcomes. Through prompt and appropriate medical management, affected children identified through newborn screening can lead to normal lives. There is still a lack of public awareness concerning the benefits of newborn screening. The newborn screening act ensures that every newborn in the Philippines is allowed to be offered newborn screening. This policy statement describes the role of pediatricians, parents, hospital administrators, and the government. It supports the Department of Health and the National Institute of Health's efforts toward nationwide implementation of newborn screening.

Compliance with Newborn Screening is a joint responsibility of the parent(s)/legal guardians, health practitioner, or other person delivering the newborn. It is also the responsibility of the health practitioners to fully inform their patients' parents or legal guardians about the availability, nature, and benefits of NBS. The trained health workers such as physicians, medical technologists, nurses, and midwives perform the collection of samples. In Zamboanga City, the trained public health nurses and midwives in 16 Rural Health Units and the lying-in clinics do a newborn screening tests. Specimens are then properly transported to the DOH-accredited Newborn Screening Centers (for Mindanao clusters, all specimens are sent to Davao NBS Reference Center) by any fast and timely mode of transport within twenty-four hours following the collection of the sample. NBS Program at the Rural Health Units in Zamboanga City became full implementation in 2013. However, this comprehensive newborn screening Program started implemented in the Rural Health Units in 2012, while in some private hospitals in Zamboanga, NBS as part of the routine procedures since 2006. Out of the 1,252 **(**inborn)and 260 (outborn) cases, the local health office reported 31screen-positive cases. (Congenital

hypothyroidism/CH(0);Congenital Adrenal hyperplasia/CAH__0_;Galactosemia/GAL(**2**);Phenylketonuria/PKU(0);Glucose-6-phosphate dehydrogenase, enzyme Deficiency/G6PDD 29(CHO, 2016)

The expanded NBS is optional to parents in all health facilities, including screening five disorders for non-Philhealth members and Phil health members; the newborn care package was on the full complement of disorders.

This study aims to assess the implementation of comprehensive newborn screening in Rural Health Units in Zamboanga City.

2. Results and Discussion

This is a Descriptive Retrospective Study using Quantitative-Qualitative techniques. It was conducted in 2019 before the start of the COVID 19 pandemic.

The respondents of this study were limited to mothers (and legal guardians) with infants ages zero to one year old who delivered their babies in the Rural Health Units (RHUs) or barangay Health Stations (BHS) during the conduct of this study. Parents with newborns and infants who delivered their babies in thehospital were excluded from this study.

Data were gathered using a questionnairechecklist prepared in English and translated into Cebuano and Chavacano, the dominant dialects in the community. The questionnaire included sections on demographic profiles and indicators determining the respondents' knowledge of newborn screening. It did not contain any degrading, discriminating, or other unacceptable languages that could be offensive to the respondents. It was designed to collect information directly related to the study's objectives.

Interviews were also conducted with the health personnel assigned in the Phil health Accredited Rural Health Units in Zamboanga City, who had formal training on implementing the NBS Program. As mentioned above, that personnel assigned in the RHUs but not trained to implement the NBS program were excluded.

Before the actual data gathering, ethics clearance was obtained from the Research Ethics Oversight Committee (REOC) of the implementing agency. Permission from the City Health Office was sought to interview the parents and the health personnel

Information provided includes the objectives, significance, and nature of their participation, including their rights, privileges, and safety information. In this particular study, there are no risks involved. Therefore, they signed the consent forms voluntarily after providing all the information to the respondents.

A face-to-face data collection was done using a researcher-made Guided Questionnaire Checklist for the Parent-respondents. The tool contains the following information:

Client-Related Factors such as knowledge of Newborn Screening, which was translated into local dialects, Socio-Demographic Profile such as age, religion, educational attainment, and family income; Health Service-Related Factors, such as availability of NBS Specimen Collection Kits in RHUs, availability of trained personnel, Referrals & Recall, and Initial Management and dietary supplementation. The content validity of the questionnaire was confirmed by the review/technical panel.

Nurses and midwives assigned to the health Centers were interviewed using an *Interview Guide for the Health Personnel*. The tool includes data regarding the training of the personnel to do the smear preparation availability of the NBS collection kits. It records reviews on the total number of clinic deliveries, newborn screening and results, referrals, and management of positive cases.

The data was analyzed through frequency distributions, descriptive statistics, and other appropriate measures. Anonymity, no violation of privacy, and the right to self-determination were observed throughout the study. All data gathered were handled with strict confidentiality.

The data in Table 1 shows the demographic profile of Parent-Respondents

Table 1. Demographic Profile of Parent-Respondents

Age Groups		**Percentage**
16-24		36.36
25-34		54.55
35-44		9.09
Total		**100**
Educational Attainment		**Percentage**
College		27.27
High School		54.54
Grade School		18.18
Total		**100**
Parents' Knowledge towards Newborn Screening		**Percentage**
1. Newborn screening (NBS) is a public health program.		61.82
2. Newborn screening (NBS) is aimed at the early identification of infants who are affected by certain genetic/metabolic/infectious conditions		72.72
3. Newborn screening is the process by which infants are screened shortly after birth		83.66
4. Newborn screening is the process by which infants are screened for a list of disorders that are NOT treatable (but difficult or impossible to detect clinically.)		72.72
5. Universal newborn screening (NBS) aims to identify infants that appear healthy at birth but are afflicted with conditions that can cause severe illness or death.		72.72
6. Newborn screening tests are offered to all infants.		72.72
7. Ideally, newborn screening samples are collected from the infant between 24 hours and 7 days after birth.		72.72
8. Samples can be collected at the hospital or by midwives.		72.72
9. Newborn Screening tests for disorders such as: 9.1 CH (Congenital hypothyroidism) 9.2 CAH (Congenital adrenal hyperplasia), 9.3 GAL (Galactosemia), 9.4 PKU (Phenylketonuria) 9.5 G6PD Deficiency.		50.00
10. If the baby is delivered at home, the baby can still undergo the screening tests		77.27
11. A negative screen means that results are normal		72.77
12. A positive screen will require the baby to undergo further testing by a Pediatrician.		72.72

The table above shows the indicative statements describing the parents' knowledge of newborn screening. Generally, the parents have a good understanding of "Newborn Screening" (73%), except for item number 9 on the different newborn conditions. Only 50% of the parents understand and are familiar with the different newborn disorders.

Trained to do blood Smear Preparation	Responses
Physicians	Yes
Nurses	Yes
Midwives	Yes

The health personnel is trained to do the blood smears.

Summary of Results

	Newborn Screening Done
2019 (Deliveries in RHUs)	**Yes**
RESULTS	
CH (Congenital hypothyroidism)	4
CAH (Congenital adrenal hyperplasia),	0
GAL (Galactosemia),	0
PKU (Phenylketonuria)	0
G6PD Deficiency	24
Home-Based Deliveries 2019	**Newborn Screening Done Yes**
RESULTS	
CH (Congenital hypothyroidism)	0
CAH (Congenital adrenal hyperplasia),	0
GAL (Galactosemia),	0
PKU (Phenylketonuria)	0
G6PD Deficiency	2

3. Conclusion and Recommendations

Seventy-three percent of the parents understand the Newborn Screening Program, except for the different newborn conditions, where only 50% of the parents understand and are familiar with the different newborn disorders.

The health personnel in the Rural Health Units (RHUs) are compliant to refer and manage positive cases. Newborns with a positive result are recalled for confirmatory testing as soon as possible, and newborns with a confirmed diagnosis are referred for treatment and management to a medical specialist.

It is recommended to widen the scope of this study and compare the results since it was conducted before the COVID 19 pandemic.

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Conflict of Interest Statement

To our knowledge, the authors have no conflict of interest, financial or otherwise.

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