

RESEARCH ARTICLE

Prenatal and Postnatal Interventions and Neonatal Mortality among Adolescent Pregnancies in the Cordillera Administrative Region

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Abstract

Background: Adolescent pregnancy remains a significant public health problem in the Philippines wherein teenage pregnancy has been declared as a National Social Emergency.

Objectives: This study aims to identify the received services and interventions during prenatal and postnatal visits and investigate the relationships between the received services and interventions during visits and the completeness of received services to neonatal death among adolescent pregnancies in the Cordillera Administrative Region.

Methods: This study used a descriptive correlational study design. A survey questionnaire was distributed to target participants among selected municipalities in the Cordillera Administrative Region and asked about the received services/interventions during and after pregnancy. Responses were analyzed using frequency and percentage, Chi-square and Phi Correlation Coefficient.

Results: The study showed that a high incidence of neonatal deaths occurs during the first delivery while decreasing prenatal and post-natal visits have been noted. It was also observed that neonatal mortality is high particularly among the category of middle adolescents. The study also demonstrated a significant correlation between Blood Testing and Measurement of the Abdomen or fundal height measurement provided to the respondents and neonatal mortality in the third trimester. However, no significant correlation coefficients have been noted between neonatal mortality and completeness of prenatal and postnatal services.

Conclusion: Policies and programs on adolescent health development should be enhanced, first, to focus on preventing adolescent pregnancy and repeat pregnancies during the adolescent period, while strengthening the access to health services for all pregnant women, especially adolescent mothers.

Keywords: *Adolescent Pregnancy, Neonatal Mortality, Primary Health Care Services, Interventions.*

Introduction

Considered globally as a health problem, adolescent pregnancy has been linked with having adverse fetal abnormalities and increased maternal and neonatal deaths. In the Philippines, teenage pregnancy has been declared a National Social Emergency (PDI, 2019). The Cordillera Administrative Region (CAR) has been reported to have the highest percentage of adolescent pregnancy incidence in the country at 18.4% among adolescents aged 15–24 years old, which is higher than the national incidence of 13.6% (YAFS, 2013).

Adolescence is the phase of life between childhood and adulthood, from ages 10–19 (UNICEF, 2011) and divided into early (10–13 years), middle (14–16 years), and late (17–19

years) adolescence (WHO, 2018). WHO (2015) “envisions a world where every pregnant woman and newborn receives quality care throughout pregnancy, childbirth, and the postnatal period”. The adolescence stage is a period of development and growth which happens after childhood and before adulthood. Next to infancy, the adolescent stage is a stage where an evolution in the genes occurs, because this is where a significant change in growth and bodily changes occur. This stage marks the transition from childhood to puberty. Thus many biological stages occur during this time of growth and development. The Department of Health envisions a nation where every pregnant woman and newborn receives quality care throughout the prenatal and postnatal periods.

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Studies have shown the link between adolescent motherhood and having poor health outcomes on both mother and infant (Glassman, A., et. al., 2012, UNICEF, 2011). Globally, it was reported that almost 45% of deaths under five years of age were born from adolescent mothers (Black R., et.al.,2016). Hence, studies that call on reducing neonatal mortality rates born from mothers in this age group is necessary. Around 95.8% pregnant women and 62.3% of postpartum women avail healthcare services in the Philippines. While in CAR, it was recorded to be at 98.1% and 83.4% (National Demographic and Health Survey, 2013). Within the continuum of reproductive health care, prenatal services and interventions are necessary during pregnancy. It composes of screening for health conditions that are likely to increase the possibility of adverse pregnancy outcomes, providing therapeutic interventions and educating pregnant women about planning for safe childbirth. The postnatal period is a phase that needs close observation as it is critical to ensure the lives of mothers and their newborn babies. Most mother and infant mortalities happen during this time. Yet more often than not, this is where the provision of the quality of care is the poorest. The first 48 hours of a neonate's life is the most critical time needed to be monitored to prevent complications that can lead to deaths. To lower neonatal deaths occurring on the first 48 hours, postnatal care services and interventions were focused to help safeguard women from complications arising from pregnancy (WHO, 2012). Utilization of these services are affected by several factors such as maternal age, women's educational level, couple's occupations, place of delivery, mode of delivery, number of pregnancies, awareness of the danger signs in pregnancy, and awareness of packages that can be availed before, during, and after pregnancy (Workineh & Hail, 2014, Berhe, 2013, Afework. 2013, Worku A. G., et.al., 2013, Regassa, 2011). Prenatal and Postnatal care programs for adolescent mothers are needed to improve pregnancy outcomes and support the adolescent mother's own health and development.

The International human rights law includes provisions for the creation of each state of policies to enable women and adolescent girls to survive pregnancy and childbirth. This is part of their enjoyment of sexual and reproductive health and the rights of living a life of dignity (OHCHR, 2016). The World Health Organization (2015) envisions a world where "every pregnant woman and newborn receives quality care throughout the pregnancy, childbirth and the postnatal period" (Tuncalp, et.al 2015). Since the 1990s, the international community has implemented important initiatives to reduce the morbidity and mortality of mothers, infants, and newborns. The Millennium Development Goals (MDG) was highlighted, as well as the current Sustainable Development Goals (SDG) that reinforce good health and well-being for women and children (Goal 3), coupled with the target of universal health coverage (United Nations, 2017) and reflected in the renewed 2016–2030 Global Strategy for Women's, Children's and Adolescents' Health

(WHO, 2017). To integrate and improve health system performance, Maternal and child health (MCH) care frameworks have been proposed simultaneously as the so-called continuum of care for maternal, newborn, and child health. This continuum has been presented as a rallying call to reduce the toll of maternal, newborn, and child deaths, and has reached a solid international acceptance (Kerber, et.al, 2007). Although significant results have been observed during the last two decades, there are still about 295,000 women who died in the duration of pregnancy to childbirth and following pregnancy and childbirth in 2017. These figures are still very alarmingly high. (WHO, 2020).

The study seeks to address the following questions: (1) What are prenatal and postnatal services and interventions received by adolescents during and after pregnancy? And (2) Is there a significant relationship between received primary health care services/interventions by pregnant adolescents and adolescent mothers to neonatal mortality? Also, it aims to establish baseline data on the number of adolescent mothers with 1st, 2nd, and 3rd, delivery during the adolescence period, and adolescent mothers with neonatal deaths in the entire region.

Methodology

Study design

A descriptive correlational design was used in the study.

Study population

Participants of the study are adolescent mothers aged 10-19 y/o who delivered a baby whether 1st, 2nd, or 3rd baby, dead or alive, who consulted their prenatal and postnatal visits in City Health Offices, Rural Health Units and Barangay Health Stations from January 01, 2014, to December 31, 2016, and who lived for at least two years in participating municipalities/cities of the Cordillera Administrative Region.

Sampling Technique

Purposive random sampling was used. The top three municipalities in every province with a high incidence of adolescent pregnancies in the Cordillera Administrative Region including Baguio City were selected as research areas. Incidence is based on the reported teenage pregnancies from January 1, 2014, to December 31, 2016, to the Field Health Services Information System (FHSIS). Participants should meet the inclusion and exclusion criteria. The survey monkey calculator was utilized to compute the sample size with the following assumptions: the confidence level used was 95%, z-score of 1.96 and a margin of error of 5%. A total of 371 was computed as the sample size and distributed to the top three municipalities of each province and in Baguio City. The percentage of each province was calculated as the total reported

number of adolescent pregnancies in every province in CAR from 2014 – 2016 divided into the total number of reported adolescent pregnancies in the region from 2014-2016 multiplied by 100. While the distribution of the sample in each municipality/city was calculated as the total number of reported adolescent pregnancies in the municipality divided by the sum of the reported number of adolescent pregnancies in the three participating municipalities in the province.

Site of the study

The study was conducted in Baguio City and the municipalities of Bangued, Bucay and Lagangilang of the Province of Abra; municipalities of Conner, Flora, and Luna of the Province of Apayao; municipalities of La Trinidad, Buguias and Mankayan of the Province of Benguet; municipalities of Aguineldo, Alfonso Lista and Lagawe of the Province of Ifugao; municipalities of Pinukpuk, Rizal and Tabuk City of the Province of Kalinga and municipalities of Bauko, Paracelis, and Tadian of Mountain Province.

Data Collection and Analysis

Data were collected using a self-administered and pretested questionnaire via a face-to-face interview at the participant's home or in the Barangay Hall. Questionnaires contained questions on the healthcare services and interventions in prenatal and postnatal periods based on the Department of Health, Center for Health Development, Cordillera Administrative Region (DOH CHD CAR) Family Health Diary. Two health program researchers and one research assistant were involved in the data collection process. Orientation was given to data collectors before the conduct of the study. A Filipino adolescent who is pregnant and delivered a baby in the year 2014-2016 and who lived in the study area for at least two years were the main selection criteria of the study. Prenatal and postnatal services and intervention utilization were measured during their first delivery.

Data were entered excel and exported to Statistical Package for Social Sciences (SPSS) version 20 for further analysis. The descriptive method was used for objective 1 and 2 and measured through frequency and percentage while Chi-square was used for the relationship between received services/interventions to neonatal death and Phi correlation coefficient was computed and tested to determine the relationships between completeness of services/interventions to neonatal death whether the two variables are related. Data on neonatal deaths were based on the reported cases in the FHSIS of the DOH CHD CAR.

Ethical Considerations

Ethical Clearance was obtained from the Cordillera Regional Health Research Development Consortium, Ethics Committee.

An official letter of cooperation was written to the participating Provincial Governors and City/Municipal Mayors and a copy was furnished to Provincial Health Offices and City/Municipal Health Offices. Community Elders and Leaders identified the participants. A written consent was secured from each respondent after explaining the nature of the study. Their participation is completely voluntary and they can withdraw at any point in time most especially when they are not comfortable with the questions. In ensuring confidentiality, personal identifiers were eliminated.

Results

Demography

Three hundred seventy-one (371) pregnant adolescents from the total of registered adolescent mothers in the Cordillera Administrative Region for the year calendar years 2014 – 2016 were identified as participants in the study. Baguio City has the highest number of enrolled participants with 87 (23%) while Mountain Province has the least of participants with 36 (9.7%).

Of the registered participants, 25 (7%) were in the elementary level, 21 (6%) were elementary graduates, 108 (29%) were in high school level, 81 (22%) were high school graduates, 116 (31%) were in college level, and only 20 (5%) have graduated in college when they became pregnant.

The age group of participants has a mean of 16.62 and a median of 16. 51% belongs to the middle adolescent (14-16 years old), 48% are from the late adolescent (17-19 years old) and 1% came from the early adolescent (10-13 years old).

Pregnancy

Registered participants who delivered a baby for the first time had the highest number at 253 (68.19%) and with 15 neonatal deaths at 5.93% mortality rate. Meanwhile, 96 (25.87%) had their second delivery with 4 neonatal deaths at 4.17% mortality rate. 22 (5.92%) adolescents had their third delivery with 1 neonatal death at 4.54% mortality rate. No participant has delivered twice or thrice in the year 2014 - 2016.

Visits

First trimester visits have the lowest registered prenatal visits by adolescent mothers at 296 (80%). While the postnatal visit in the 1st week is slightly higher than the postnatal visit after a week. 272 (73%) completed their prenatal visits while 222 (60%) completed their postnatal visit.

Services and Interventions Utilization

First Trimester: The least utilized services/intervention during the first trimester were Blood testing for Benguet (57%) and Mt.

Province (56%); Fetal Ultrasound for Abra (46%) and Kalinga (61%) in while; Counselling for the Newborn Hearing Screening for Apayao (74%) and Ifugao (46%); and Counselling on the Danger Signs of Pregnancy for Baguio City (54%).

Second Trimester: Deworming had been noted as the least utilized services during the second trimester among all provinces/city. The above service registered a percentage of utilization as follows: Abra (40%), Apayao (56%), Baguio City (53%), Benguet (45%), Ifugao (52%), Kalinga (61%) and Mt. Province (61%). Counseling for the Newborn Hearing Screening is also an underutilized intervention in Ifugao (50%).

Third Trimester: The least utilized services/interventions among the provinces/city were Counselling for the Newborn Hearing Screening in Abra- 56%), Pelvic Examination (Apayao- 77%), Counselling for the Danger Signs of Pregnancy (Baguio- 82%), Monitoring of Fetal Growth (Benguet- 64%), Counselling for the

Newborn Hearing Screening (Ifugao- 50%), Pelvic Examination (Kalinga- 59%), and Monitoring of Fetal Presentation (Mt. Province-75%).

Postnatal

Participants from Abra (60%), Apayao (69%), Ifugao (59%), and Kalinga (65%) identified the Newborn Hearing Screening as the service that has the least utilization among the services/interventions during the postnatal period. While the assessment of emotion after delivery has the least utilized service in Baguio City (72%), Benguet (61%), and Mt. Province (78%).

Relationships of received services and Interventions to Neonatal Mortality

Results showed that “blood testing” and “measurement of the abdomen or fundal height” services in the third trimester have significant relationships to neonatal mortality.

Table 1. Correlation of services / interventions provided to the respondents and neonatal mortality per trimester
CAR, CY 2014 – 2016

Services / Interventions	1 st Trimester		2 nd Trimester		3 rd trimester	
	P - value	Significance	P - value	Significance	P - value	Significance
Height	0.5	NS				
Weight	0.48	NS	0.8	NS	0.19	NS
Temp	0.41	NS	0.6	NS	0.58	NS
Blood Pressure	0.48	NS	0.82	NS	0.96	NS
Blood Testing	0.99	NS	0.14	NS	0.027	Significant
Urinalysis	0.79	NS	0.61	NS	0.38	NS
Fetal Ultrasound	0.94	NS	0.46	NS	0.16	NS
TT1	0.8	NS				
TT2	0.88	NS				
Iron Folate	0.69	NS				
Birth Plan	0.64	NS	0.88	NS	0.71	NS
Maternal Nutrition	0.86	NS	0.9	NS	0.75	NS
Family Planning	0.87	NS	0.8	NS	0.61	NS
Oral Health	0.92	NS	0.96	NS	0.56	NS
Breast Feeding	0.56	NS	0.89	NS	0.94	NS
NBS/ Expanded NBS	0.96	NS	0.8	NS	0.44	NS
Newborn Hearing Screening	0.8	NS	0.62	NS	0.35	NS
Lifestyle	0.78	NS	0.77	NS	0.72	NS
Pregnancy Discomforts	0.88	NS	0.54	NS	0.55	NS
Danger Signs	0.92	NS	0.74	NS	0.86	NS
TT3			0.51	NS		NS
Fetal Growth			0.71	NS	0.77	NS
Fetal Movement			0.84	NS	0.76	NS
Fetal Presentation			0.8	NS	0.53	NS
Deworming			0.53	NS		
Measurement of Abdomen					0.002	Significant
Pelvic Exam					0.16	NS

*p-value significant at <0.05

Relationships of the Completeness of received services and Interventions to Neonatal Mortality

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Out of 306 who received incomplete services/intervention during prenatal visits, 291 of them were able to avoid experiencing neonatal mortality. Meanwhile, 269 participants received incomplete postnatal services/intervention, 256 of them did not have neonatal mortality. Phi correlation coefficient was computed and tested to determine whether the two variables are related. As evidenced by the corresponding p-value of the test conducted (p-value is greater than 0.05), the variables are not related.

Discussion

Neonatal mortality in the Cordillera Administrative Region has declined from 2014 to 2016, but it has been noted that the report involves all reproductive ages. Though in the study, which is concentrated on adolescent mothers, the fatality rate is alarming. Based on the results, neonates born from middle adolescent mothers have higher chances of mortality because the physiological structures of the mother are still developing at this stage. This notion also compliments the report from the World Health Organization in 2010. In another study in South and Southeast Asia, mothers who were aged 16 and below had infants with more complications and deformities leading to deaths as compared with those mothers aged 20-29 years (Sharma, et. al., 2008., Mekonnen., et. al., 2013). Several reasons have been hypothesized for this matter. One theory explained the underpinned nutritional insufficiencies wherein the adolescent mother and the unborn fetus have competing nutritional needs, both requiring energy and growth. The competition for nutrients that arises when pregnancy coincides with continuing or incomplete growth in young adolescent girls increases the risk of preterm delivery and low birth weight with negative after-effects for mother and child extending beyond the perinatal period (Wallace J.2019). The notion that the adolescent period is the healthiest period compared to adulthood and early childhood must be disregarded. Adolescent health is also one that is of equal importance (Sawyer SM., et. al., 2012). More so, when the adolescent is in the pregnancy stage.

Results also revealed that adolescents received lesser services and interventions from DOH CHD CAR FHSIS due to a decrease in prenatal and postnatal facility visits. The FHSIS data came from the reports submitted by health care facilities to enable the Department of Health to better manage its national health service delivery activities. The risk of prematurity, stillbirth, early and late neonatal death, and infant death increased linearly with decreasing care. Having adequate access to maternal health is necessary to increase adolescents' awareness of the increased risks posed by having a pregnancy at an early age (Neal, 2018). Ample evidence points the stigma and discrimination faced by

pregnant adolescents when seeking care in many contexts (Atuyambe, et. al., 2005). Likewise, developed services that are sensitive to their needs are being compromised. This study stressed the importance of accessing maternal health care services during and after pregnancy of adolescents and its link on the adolescent sexual health and child health agendas. High-quality and appropriate health care services and interventions can serve as one of the possible pathways in decreasing neonatal mortality. As an example, prenatal and postnatal healthcare packages can alleviate potential underlying factors that increase the risks.

Analysis indicated that the interventions were maybe not effective in preventing repeat pregnancies as indicated by the result of the study. Also, it has been noted that a high percentage of neonatal deaths occurs during the first pregnancy. Services and intervention should have focused during the early adolescent period to mitigate not only adolescent pregnancies but repeat pregnancies during the adolescent period as well. While Atuyambe., et.al (2008) reported that most adolescents have received prenatal services/interventions during their first pregnancy, the results of this study suggested otherwise. Adolescent mothers seek care in the latter stage of pregnancy or after, make fewer visits during pregnancy, and received fewer components of care than those older first-time mothers. Efforts to entice this vulnerable group and reduce barriers in availing health care service are essential in promoting their health. The prevention of adolescent pregnancies will have a marked impact on the reduction of neonatal deaths, and accelerate progress towards the neonatal SDG target, with the greatest gain amongst reducing births in the most vulnerable under-19 age group. In addition to developing comprehensive adolescent reproductive health services, coordinated actions from all sectors are warranted to reduce adolescent births, minimize or eliminate child marriage, lessen very early adolescent births, and improve child protection.

The study also demonstrates that in a general sense, health care services/interventions are not at all related to neonatal mortality except for "blood testing" and "measurement of the fundal height" services in the third trimester. Petrikovsky B., Jacob J., Aiken L., (2001) emphasized the importance of blood testing during the prenatal period which determined the blood type, iron level to see if the mother is anemic, blood glucose level to check for diabetes, and the Rh factor (if the mother is Rh-negative, and the father's is Rh-positive, the fetus may inherit the father's Rh-positive blood, which could cause the mothers body to make antibodies that would hurt the unborn child). The mothers will also be tested for HIV, Hepatitis B, and Syphilis, as well as whether their immunity against rubella (German measles). Being infected with Rubella during pregnancy, especially in the first trimester, can cause birth defects. Also, Arora (2018) stresses the significance of the

measurement of the abdomen or the fundal height measurement. This prenatal service indicates abnormalities like slow fetal growths, abnormally large fetuses, and too little or too much amniotic fluid.

Limitations

This study has certain limitations. As in other studies employing questionnaires, recall bias is a possibility. In determining the appropriate primary health care interventions received by pregnant adolescent and adolescent mothers in the Cordillera Administrative Region, the study focuses on the services and interventions received during their first delivery. Furthermore, the study only involves adolescents who are pregnant and delivered a baby in the year 2014-2016 in the Cordillera Administrative Region. This limits the study's generalizability. The results may not necessarily be extrapolated to adolescents in other regions or other countries. It is very important to bear in mind that adolescents may vary in terms of their traditional and cultural practices.

Policy Relevance and Recommendations

Strengthening activities for the provision of health care services and interventions among adolescents is vital in addressing the problem.

Adolescent Friendly Health Services, a strategy of the Department of Health, should be adopted and practice by all City/Rural Health Units and Barangay Health Services to adhere to and address the needs of adolescents. The service's primary aim is not only to protect young people against dangers but also to help them to build knowledge, skills, and confidence. Friendly health services that meet psychological as well as physical needs. It emphasizes the importance of understanding adolescents' views on health centers and stakeholders' perspectives on health services since they both affect the way health centers function. Strengthening health system activities for quality improvement initiatives should be supported by the local government and support partners. These activities initially focused on capability and capacity building for healthcare providers that included training related to improving the clinical and psycho-social care and management of adolescents, conducting support groups and instituting more user-friendly times and days for adolescents to access care and treatment. The group dynamics with pregnant teenagers in the space destined for prenatal care favored greater interaction between health professionals and these young mothers.

Policies and programs on adolescent health development should be enhanced, first and foremost, to focus on preventing adolescent pregnancy and repeat pregnancies during the

adolescent period, while strengthening the access to health services for all pregnant women, especially to adolescent mothers.

Conclusion

This study posed that there is an increased risk of neonatal deaths born from adolescent mothers. It also presented the services and interventions availed by mothers in the region and has linked the underutilization of services with the increasing risk of maternal and neonatal casualties or mortalities. Subsequently, underutilization of services can also affect succeeding births. Highlighting the importance of using these packages during and after adolescent pregnancy can reduce neonatal births and can be a strategy to address one of the SDG goals.

Furthermore, this study only investigated neonatal deaths as an outcome. Exploring other outcomes, such as miscarriage and stillbirth, is warranted to have a comprehensive picture of possible risks of adolescent pregnancy. Also, identifying the factors affecting the utilization of prenatal and postnatal care services and interventions are also important to improve the delivery of health care. Thus, follow-up research is recommended.

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*In the beginner's mind there
are many possibilities,
but in the expert's there are few*

— Zen quote, **Shunryu Suzuki**
in *Munhall*, 2012, xiv