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DETERMINANT FACTORS AFFECTING MATERNAL HEALTH CONDITIONS AMONG PREGNANT WOMEN IN CONSOLACION, CEBU

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ABSTRACT

One of the vital challenges among pregnant women is to acquire quality maternal health care services. It is essential to improve healthy pregnancy and promote healthy childbirth. Also, to truly understand and increase awareness of the difficulties among pregnant women in rural and urban communities. This study aims to assess the utilization of maternal health services and identify demographic and socio-economic factors that influence maternal conditions among pregnant women in Consolacion, Cebu. It also aims to provide information necessary to improve the provision of maternal health services. This study adopted the social survey design and data from the survey questionnaires conducted on 353 pregnant women in the community attending the antenatal care services of the different barangay health centers. Kruskal-Wallis test was applied to assess Antenatal Care utilization and Principal Component Analysis to determine social and demographic factors affecting Antenatal Care health services among pregnant women. Qualitative analysis of data to provide information necessary to improve maternal health services. The majority of the pregnant women frequently visited the barangay health centers and revealed a high level of ANC use. Most of the respondents belonged to the group of 18 - 26 years old and 27 – 35 years old, were high school graduates, married, unemployed, and Catholics. The study associated sociodemographic factors such as age, religion, education, marital status, and occupation significantly influenced the pregnant women's use of maternal health care services in the community. In addition, factors such as the availability of health care workers and health facilities, long waiting time, and friendly services of barangay health attendants influenced the utilization of maternal health care services. Overall, there was a high level of ANC utilization among pregnant women. The prevalence of good prenatal care and the desired optimal health care process was perceived among pregnant women who availed themselves of ANC services. Moreover, adequate numbers of well-trained and skilled health professionals and the availability of sufficient equipment and supplies in the health facilities were necessary to improve the provision of health services.

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INTRODUCTION

Background of the Study: Pregnancy and delivery are essential events in human life. It is therefore important to pay special attention to women during pregnancy (WHO, 2015). The health of the women during their pregnancy and delivery is vital for the mother and their children (Kifle *et al*., 2017). Every year, more than 200 million women become pregnant and 15% of which are at risk of complications that have the potential to cause disease and death (Heron *et al*., 2010). One of the strategies for reducing the maternal mortality ratio is ensuring access to and utilization of maternal and child health services (Kade and Moore, 2012), which are critical to the survival of both the infant and the mother (Srivastava *et al*., 2015) and play a significant role in preventing complications that lead to death and deformity (Gupta and DaCosta, 2009). Maternal deaths are due to many causes including hemorrhage, hypertensive disorders, abortion-related complications, infections, and sepsis (Roberts *et al*., 2011).

According to WHO (2012) and Philippines Health Statistics (2010), the major causes of maternal death in the Philippines are complications during pregnancy, delivery, and the postpartum period (i.e., pregnancy-induced hypertension, postpartum hemorrhage, and puerperal infection). Infections are a major public health problem in developing countries (Wekesa, 2014). Such infections during pregnancy are dangerous and have life- threatening complications (Villines, 2018). Maternal health has been becoming a global concern because the lives of millions of women of reproductive age can be saved through maternal health care services (Gyimaha *et al*., 2006). ANC promotes the health of pregnant women and has been found to reduce the risk of adverse pregnancy outcomes (Brown *et al*., 2008). As part of reproductive health care, ANC presents a unique and lifesaving opportunity for health promotion, disease prevention, early diagnosis, and treatment of illnesses in pregnancy. Most of the common causes of maternal and neonatal morbidity and mortality are readily preventable, detectable, and manageable (WHO, 2018). It is estimated that 74% of maternal deaths could be avoided if all women

had access to maternal health care utilization (Ayele *et al*., 2014). Different factors have been found to be related with the utilization of maternal health care services, and the associated factors can be categorized as socio-economic and demographic factors such as the educational status of the mother (Bahilu *et al*., 2009), maternal age (Zeine *et al*., 2010), occupation (Chakraborty *et al*., 2003) and factors related with women's perceived quality of maternal health care services (Yakong *et al*., 2010). In the Philippines, prenatal care is a widely accepted practice. Almost 96% of mothers had visited a health provider for their prenatal care (NSO and Macro International, 2010). A previous study reported that 84% of pregnant women received antenatal checkups in the Philippines (PSA, 2013). Pregnant women in the rural Philippines have a better chance of making ≥4 ANC visits (Wulandari, 2021). A significant finding from the analysis of Cananua-Labid (2017) is the region a woman resides predicted her ANC utilization. Specifically, higher than average competitive ANC utilization rates, came from NCR, CAR, Ilocos Region, Cagayan Valley, Central Luzon, CALABARZON, Bicol, Western Visayas or Central Visayas, Davao or Caraga. But financial and environmental barriers might hinder the utilization of healthcare services for women who deliver at home in the Philippines (Yamashita *et al*., 2017). Historically in the Philippines, health care use has been pro-rich (Paredes 2016). Consolacion is a municipality in the province of Cebu, Philippines. The demographic and socio-economic characteristics in this region constitute potential determinant factors that can affect maternal conditions, its population size, and the willingness of the local government officials permitted to conduct a research study in the community. There was no prior study that assessed the utilization of maternal health services within this community. This study will determine the risk factors affecting pregnant women attending antenatal health care services in barangay health centers of Consolacion, Cebu, to truly understand and increase awareness of the difficulties among pregnant women in rural and urban communities.

Objectives

This study aims to assess the determinant factors affecting maternal conditions among pregnant women in Consolacion, Cebu, Specifically, this study aims to:

- Assess the utilization of maternal health care services such as Antenatal Care (ANC)
- Determine the social and demographic factors that significantly influence Antenatal Care (ANC) among pregnant women
- Provide information necessary to improve the planning and provision of maternal health services

Significance of the Study: A better understanding of the influences is vital in the effective strategies to advance appropriate recommendations for reducing adverse maternal and fetal outcomes. The information gathered from interviews and survey questionnaires will help promote better health among pregnant women to prevent further complications and risks. Pregnant women will be enlightened so that they will be aware of their healthy lifestyle and good measure practices that will be helpful to improving healthy pregnancy and promoting healthy childbirth. This study will also provide the local communities and policymakers with a better analysis of the various factors that affect maternal health conditions among pregnant women.

Scope and Limitation of the Study: The study focused on determining and identifying the determinant factors and maternal health conditions among pregnant women in Consolacion from May 2021 to December 2021. A total of 353 pregnant women between 15 to 45 years old attending Antenatal care (ANC) services from the 11 barangay health centers in Consolacion were interviewed and participated in the survey. This research was based on 8-month surveys and visited the barangay health centers every Monday of the week. Information was collected from the records of antenatal care clinic cards of pregnant women who availed antenatal care services and information from the interviews of pregnant women using a survey questionnaire.

Definition of Terms: This section outlines the definition of terms used throughout the study. The meaning of each term is derived from how it is used and interpreted in the study.

Antenatal Care (ANC): is the health control of presumed healthy pregnant women without symptoms (screening), diagnosing diseases or complications of obstetric conditions without symptoms, and providing information about pregnancy and delivery.

Antenatal Care (ANC) Utilization: is the care provided by skilled healthcare professionals to women throughout their pregnancy. Through this, provision of regular monitoring and follow-up of maternal and fetal health during pregnancy to promote a healthy pregnancy, better delivery, and birth outcomes.

Balanced diet: refers to the variety of foods that fulfills all of a person's nutritional needs, consisting of adequate amounts of all the necessary nutrients recommended to stay healthy and for healthy growth.

Determinant factor: refers to a factor or a cause that makes something happen or leads directly to a decision.

Ethical considerations: are the set of principles that guide your research designs and practices. These principles include voluntary participation, informed consent, anonymity, confidentiality, potential for harm, and results communication.

Health disparities: are the preventable differences in the burden of disease, injury, violence, or opportunities to achieve optimal health that are experienced by socially disadvantaged populations.

Maternal condition: any health condition of the mother that may cause pregnancy complications.

Maternal health: the health of women during pregnancy, childbirth, and the postnatal period.

Maternal mortality: refers to the death of a woman, due to complications from pregnancy or childbirth.

Municipality: a city or town that has corporate status and local government.

Personal hygiene: are the behaviors that must be practiced in daily life, starting from morning to sleep time to protect our health. And to protect health, body, hair, mouth and teeth must be cleaned regularly and clothes must be washed frequently.

Pregnancy complications: are health problems that arise during pregnancy.

Prevalence: The fact of something existing or happening often, or occurrence.

Provision: Refers to the action of providing or supplying something for use.

Respondents: are individuals who complete a survey or interview for the researcher, or who provide data to be analyzed for the research study.

Socio-demographic factors: refer to a combination of social and demographic factors that define characteristics of a population or a specific person, such as age, marital status, education, religion, income, etc.

Survey Research: the collection of information from a sample of individuals through their responses to questions.

Susceptible: likely or liable to be easily affected with a disease, infection, or harmed; especially sensitive.

REVIEW OF RELATED LITERATURE

Globally, pregnancy and childbirth are significant events for women and their families even though they represent a period of heightened vulnerability for both women and their unborn babies (White Ribbon Alliance, 2017). In most developing countries, fertility rates are high in comparison to industrialized countries, as also are maternal and perinatal mortality rates (Royal College of Obstetricians and Gynaecologists, 1979). Persistently low utilization rates of Maternal and Child health (MCH) services in developing countries (Ahmed *et al*., 2010; Mbonye *et al*., 2006), have led some authors to the conclusion that programs that rely only on ANC as a delivery system are likely to have poor coverage and compliance (Mrisho *et al*., 2009). Every year, more than 500,000 maternal deaths occur worldwide, 4 million newborns die and another 3 million babies are stillborn. Nearly all these deaths take place in low- and middle-income countries and most could be prevented with current medical care (Gabrysch and Campbell, 2009). Every day, approximately 800 women die from preventable causes related to pregnancy and childbirth and 99% of all maternal deaths occur in developing countries (WHO, 2016). Maternal health care service has been among the most important interventions to decrease maternal morbidity and mortality (Kifle *et al*., 2017). Approaches to providing maternal and child health (MCH) services concentrating on promotive, preventive and appropriate curative services which identify mothers and infants at high risk of mortality and serious morbidity have been developed (WHO, 1976).

To ensure optimum care, the WHO previously recommended that every pregnant woman should have a minimum of four ANC visits throughout the pregnancy with the first visit occurring in the first trimester of pregnancy (Carroli, 2001; WHO, 2002). However, in 2016, WHO revised its recommended minimum number of ANC visits from four to eight contacts following recent evidence that increased number of contacts between a pregnant woman and a skilled health provider reduced perinatal mortality and improved women's experience of care (Okedo-Alex *et al*., 2019). Early ANC initiation in the first trimester of pregnancy and receiving the required services is emphasized in the revised guideline (WHO, 2018). Several studies have been reported which have used models of access to and utilization of health care to identify discriminating characteristics of individuals (classified as prediposing and enabling factors) and services which contribute to different rates of health service utilization. These have usually concentrated upon curative services for people who have perceived morbidity (Anderson and Newman, 2005; Kohn and White, 1976; Wolinsky, 1978; Kroenfield, 1980; Anderson and McCrutcheon, 1983). High maternal mortality rates in the developing world reflect inequalities regarding the accessibility of health services. Globally more than 70% of maternal deaths are due to key complications namely: hemorrhage (27.1%), hypertensive disorders (14%), infection (10.7%), unsafe abortion (7.9%), and embolism and other direct causes (12.8%) (Fillipi et al., 2016). A large number of women in Ghana die annually due to pregnancy related complications considered preventable such as severe bleeding, hypertension, sepsis infections, and unsafe abortion (Addai, 1998). Empirical studies of preventive services have often found that use of services is more strongly correlated with demographic and socioeconomic characteristics than with health beliefs (Hingson *et al*., 1976; Fiedler, 1981). Social and economic status, cultural values and norms are closely connected to maternal deaths or disabilities related to pregnancy and child birth. Generally speaking, geographic distance, poverty and marginalization of poor woman are some of the risk factors for maternal death. High maternal mortality rate is one of the indications of disparities between wealthy and poor countries (UNFPA, 2012). Studies indicated that socio-demographic factors are associated with low levels of health facility delivery include women's lack of education, rural residence, low wealth status, religion, and insufficient ANC visits (Mazalale *et al*., 2015; Samson, 2012). Social factors such as income, education, housing, food, transportation and social support, commonly referred to as the social determinants of health, also affect a wide range of health, functioning, and quality-of-life outcomes and risks.

Addressing social determinants of health may be especially difficult in rural areas, which tend to have fewer educational and job opportunities, older housing, and limited access to healthy foods. These factors and a lack of access to health services contributes to disparities in health (Kuh and Ben-Shiomo, 1997; Braveman and Barclay, 2009; Cable, 2014). Many studies in developing nations have found a strong effect of maternal education on use of maternal and child health services (Parker and Reinke, 1983; Monteith *et al*., 1987; Warren *et al*., 1987; Rutstein *et al.,* 1990; Canovas, 1991). Likewise, within countries, it is the poorest and least educated women who are most vulnerable to maternal death and disability (United Nations, 2011). Poor nutrition in general and anaemia in particular, are the main underlying causes of poor pregnancy outcomes in the developing world (Fuseini *et al*., 2010). Poor nutrition can cause tiredness, weakness, difficulty in fighting infections, and other serious health problems. Poor nutrition during pregnancy is especially dangerous (Antenatal Care Module 14, 2017). In addition, the poor nutritional status of pregnant women may result in chronic iron deficiency which accounts for a greater amount of deaths (AbouZahr, 2003). A healthy, balanced diet during pregnancy is essential to support the optimal growth and development of the fetus and the physiological changes that occur in the mother (O'Connor *et al*., 2016; The Sensible Guide to a Healthy Pregnancy, 2018). The importance of good nutrition is needed to maintain a healthy pregnancy. Poor sanitation has a direct effect on maternal health. Water and sanitation are so important when providing basic health needs for people. It makes poor mothers and children even more susceptible to disease. Water-borne illnesses, directly linked to poor sanitation, lead to malnutrition in mothers (Vinci, 2015). According to Antenatal Care Module 14 (2017), women should be careful about personal hygiene during pregnancy. Keeping the body clean helps prevent infection. Handwashing with soap is the most salient hygiene action, especially before preparing food and after going to the toilet. Women face unique challenges throughout their lives. For some, one such challenge can be pregnancy. It is an exciting and beautiful time, but it can also be a crucial test of the strength of a woman's body and mind. Pregnant women are definitely in a place of high vulnerability, but they are not weak links. Childbirth outcomes are heavily tied to socioeconomics**,** with women in more impoverished regions experiencing a wide range of additional challenges (Harveston, 2018). Pregnant women may encounter many different health problems during pregnancy. They need to receive the utmost healthcare throughout their pregnancy to ensure that they will have better health and reduce the risks of infections and further complications to survive pregnancy and childbirth.

METHODOLOGY

Study Area: Consolacion is the first income class municipality in the province of Cebu, Philippines (Figure 1). It is situated about 13 km north of Cebu City. It shares political boundaries with the Municipality of Liloan on its Northside, the City of Mandaue on its Southside, Cebu City and Compostela on its Westside, and Mactan Channel on the Eastside (MPDO - Municipal Government of Consolacion, 2001-2010).

Conceptual Framework: The analytical framework selected for this study is the Andersen Behavioral Model of Health Services Use (Andersen and Newman, 2005). The Andersen model centers on the individual as the unit of analysis and examines differences in use of health services from a socio-demographic perspective. The model postulates that decisions on use of health services (outcome factors) are largely influenced by a number of determinant factors, which are grouped as: predisposing factors, enabling factors, and need factors (Mbugua and MacQuarrie, 2018). According to Andersen and Newman framework of health services utilization (1995), an individual's access to and use of health services was considered to be a function of three characteristics: (Figure 3).

Predisposing Factors: These were the demographic and social conditions that influenced the person's decision to use the services.

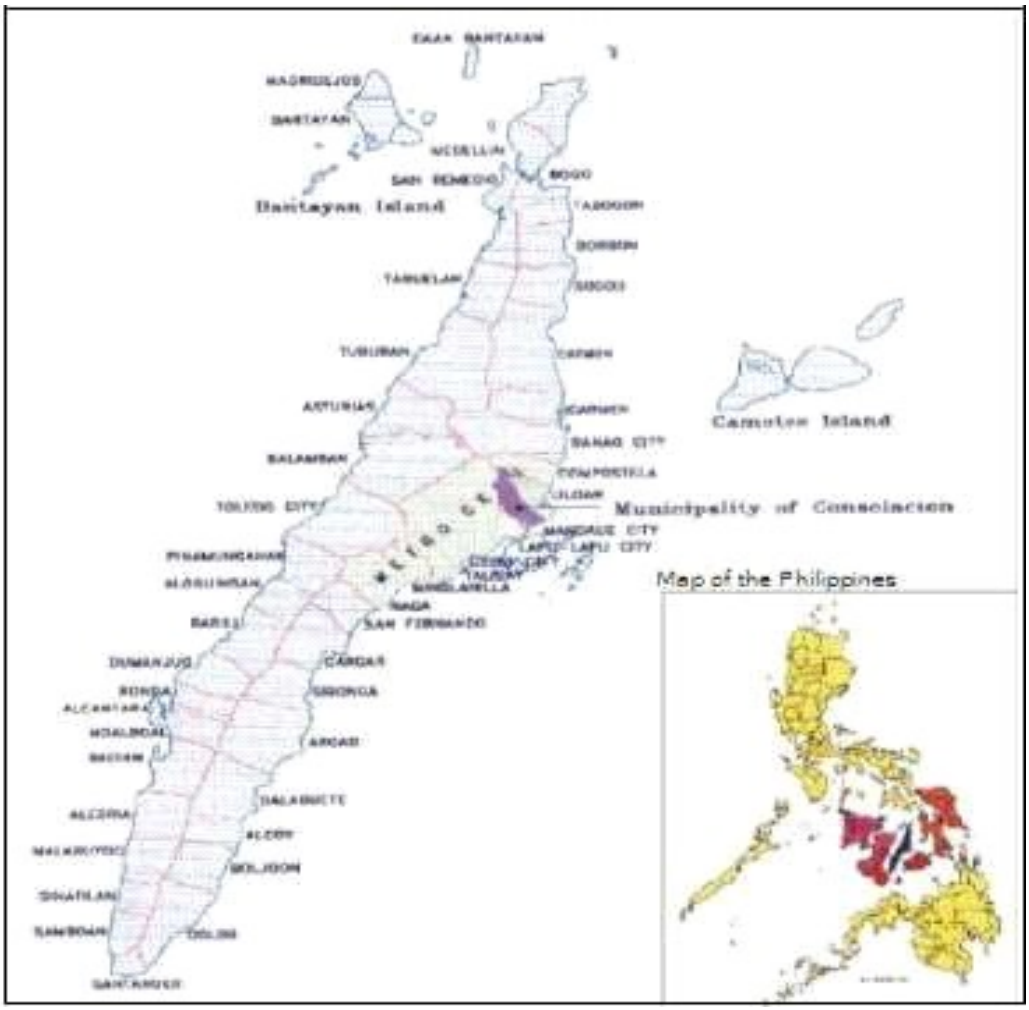

Figure 1. Municipality of Consolacion, Cebu, Philippines

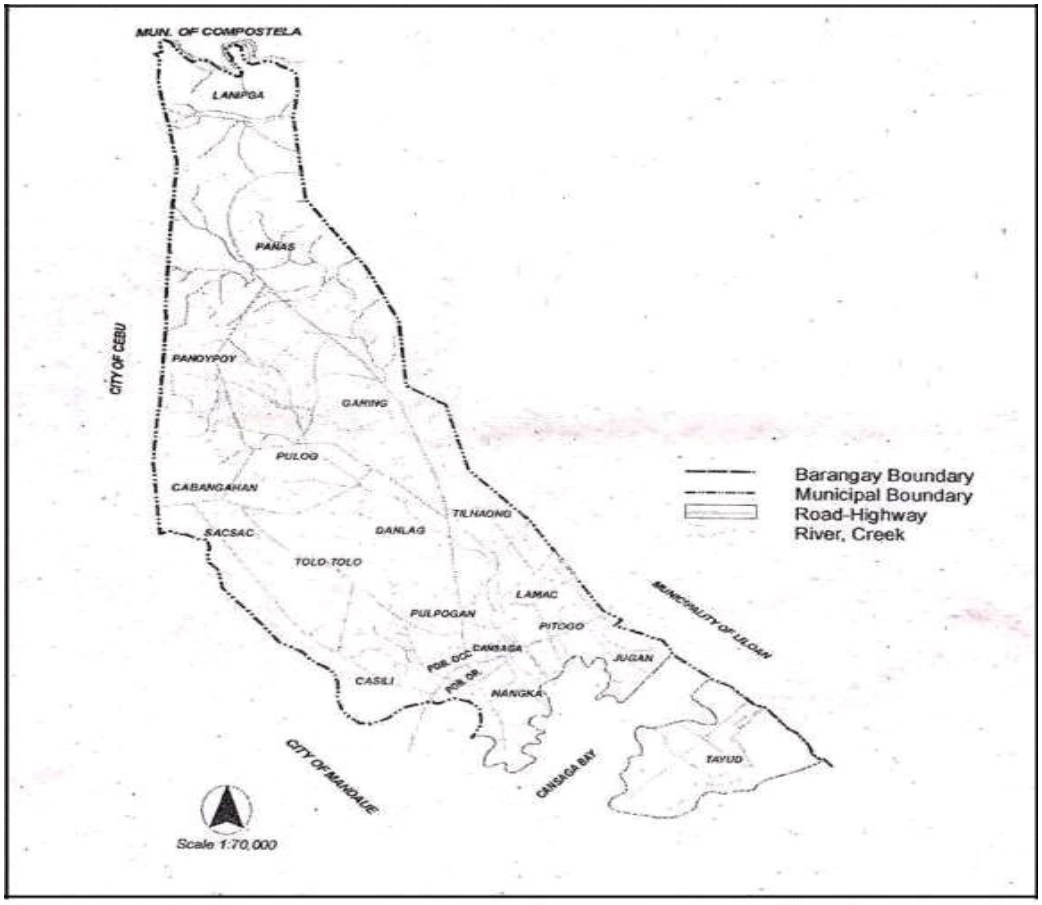

Figure 2. Location map of Barangays in Consolacion, Cebu Source: Municipality of Consolation, Cebu Comprehensive Land Use Plan 2001-2010

These were the factors that defined the character of a person. It included age, education, marital status, occupation, and religion.

Enabling Factors: These were the economic circumstances that influenced or facilitated service utilization and constituted the aspects of obtaining care. It included the availability of health care workers and health facilities.

Need factors: These were the immediate cause of health service use, from functional and health problems that generated the need for health care services. It reflected the perceived health service needs, and it included friendly services. According to the 2020 census, it has a population of 148,012 (PSA, 2021). It represented 4.45% of the total population of Cebu province, or 1.83% of the overall population of the Central Visayas region (PhilAtlas, 2022). There are twenty-one (21) barangays in the Municipality of Consolacion, Cebu (Figure 2). There were 11 barangays where survey was conducted and interviewed pregnant women, namely; Barangay Cansaga, Barangay Casili, Barangay Jugan, Barangay Danglag, Barangay Lamac, Barangay Nangka, Barangay Pitogo, Barangay Poblacion Occidental, Barangay Poblacion Oriental, Barangay Pulpogan and Barangay Tayud.

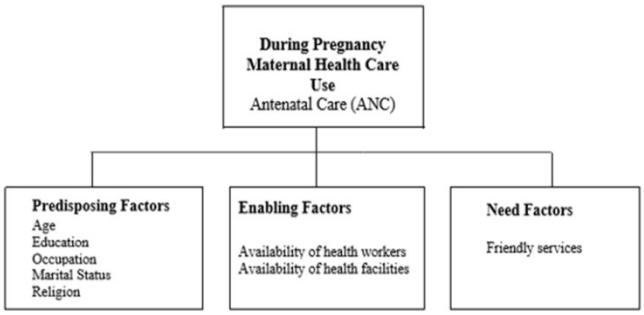

Figure 3. Modified from the Andersen Behavioral Model of Health Services Use (Andersen and Newman, 2005)

Environmental Factors: Other factors such as the resources and supply of drinking water, nutrition and healthy lifestyle, good sanitation practices and the facilities for the safe disposal of human waste, and proper garbage disposal were significant to maintaining good health and were crucial factors influencing maternal health conditions. Most pregnant women had good sanitation practices and health habits. Good sanitation and proper hygiene were vital because they helped prevent getting or spreading germs and infectious diseases since pregnant women were susceptible to the germs in the environment. Regular handwashing with soap and water is the best effective way to be protected and get rid of germs. It is also significant for pregnant women to maintain a healthy lifestyle, for it can reduce the risks of pregnancy discomforts and symptoms and birth deficiencies. Eating a healthy, balanced diet and taking vitamins to get the proper nutrients are needed to sustain a healthy pregnancy and a healthy birth weight. The majority of the pregnant women were drinking distilled or mineral water. It is safe and the purest form of water and free of dissolved inorganics, bacteria, and harmful contaminants from water. Pregnant women should drink 8 to 12 cups of water every day because water has many benefits.

ANC Utilization: Collection of data from 353 pregnant women between 15 to 45 years old who attended Antenatal care from the 11 barangay health centers of Consolacion, Cebu. Information on body weight, height, and history of pregnancies from the Antenatal care clinic records of pregnant women availing antenatal care services and from the interviews of pregnant women using a survey questionnaire. The questionnaire was prepared in English and translated into the local language. The questionnaire contained questions about antenatal care utilization and the socio-demographic characteristics of the respondents (Appendix 72, Appendix 73). There was no duplication in the filling up of survey forms. Data and information were held confidential and will be disposed of properly when the research is over. Letters were handed to the LGU, Municipality of Consolacion, Mayor Joannes Alegado (Appendix 52, Appendix 53), and the Municipal Health Director, Dr. Eleanor Fe Pardillo (Appendix 54, Appendix 55), informed them to seek approval for the research study. An announcement was posted in each barangay health center to notify pregnant women and request their participation in the research study. This research study was a quantitative type of study since the researcher conducted a survey using survey questionnaires. Data were collected from the antenatal clinic records of the pregnant women aged 15 to 45 years old attending Antenatal care services from the different barangay health centers, and the answers gathered from the interview of the pregnant women using the survey questionnaires. Descriptive statistical analysis was applied using the Kruskal-Wallis Test to assess Antenatal Care utilization and Principal Component Analysis to determine social and demographic factors affecting Antenatal Care health services among pregnant women.

Determinant social and Demographic Factors: In Table 1 were the sociodemographic characteristics of the respondents as the result of the answers to the survey questionnaires. Results from the survey questionnaires were used to determine possible risk factors affecting the maternal conditions of pregnant women. There were several socio-economic and environmental factors. Among them were age, education, marital status, poverty, handwashing habits, the resources and supply of drinking water, nutrition, inadequate practices on waste disposal, the type of toilet they were using, and poor sanitary conditions. The barangay health center having the highest number of pregnant women was determined and then related to antenatal care utilization and environmental conditions.

Table 1. Sociodemographic characteristics of the respondents in Consolacion, 2021

Variables		Frequency (N = 353)	Results
Age	15-17	15	4 %
18-26		148	42%
27-35		150	42%
36-44		40	11%
45 above			
Education	Elementary	24	8 %
High school		183	52%
Vocational		12	3 %
College		77	22%
Graduate		47	13%
Occupation	Gov't Employee	5	1 %
Private Employee		97	27%
Daily laborer		27	8 %
Unemployed		206	58%
Others			
Marital status	Single	63	18%
Married		105	30%
Separated		2	1 %
Widowed		2	1 %
Live-in		107	30%
ANC visit	Once	61	17%
Twice		71	20%
Other		181	51%
Miscarriage	None	276	78%
Once		46	13%
Twice		11	3 %
Other		2	1 %
Number of live children	1-3	226	64%
4 above		26	7%
Buy foods from vendors	Yes	323	92%
No		24	7 %
Take vitamins	Yes	318	90%
No		33	9 %
Religion	Catholic	298	84%
Protestant		6	2 %
Other		42	12%
Wash hands before eating	Yes	353	100%
No			
Wash hands after using toilet	Yes	351	99%
No		1	
Drinking water	Tap	11	3 %

Well		3	1 %
Others		335	95%
Have own toilet	Yes	311	88%
No		37	10%
Share toilet	Yes	88	25%
No		260	74%
Throw garbage	Once a week	216	61%
Twice a week		96	27%
Others		34	10%

Maternal health services: Qualitative analysis of data was the method used to provide information necessary to improve the provision of maternal health services. Information was gathered from observations and interviews conducted with the barangay nurses and midwives-in charge, barangay nutrition scholars (BNS), and health workers of the different barangay health centers.

Data Analysis: Descriptive statistical analysis using the Kruskal-Wallis test was used to assess Antenatal Care utilization. In addition, Principal Component Analysis (PCA) was utilized to determine social and demographic factors affecting Antenatal Care health services among pregnant women. PCA determines the sociodemographic factors that make the data easier to explore, visualize and analyze. Qualitative analysis of data was also used to provide information necessary to improve maternal health services.

Ethical Consideration: Ethical clearance was granted by the Research Ethics Committee (REC) of the Research, Development, Extension and Publications Office (RDEPO), USC Talamban, which had complied with REC's ethics policy requirements. Participants got informed that it was entirely voluntary and that all personal information as confidential. The information collected from this research project was kept and not shared with anyone, so only the researcher had access to the data. Six months after being published, data from laptops and flash drives were deleted, and copies of the answered questionnaires were shredded and disposed of properly. The knowledge and the results of the processed data were shared and available to the public. Each participant will receive a summary of the results when published so that other interested people may gain knowledge from the research.

RESULTS AND DISCUSSION

ANC utilization: The majority of the pregnant women (51%) frequently visited barangay health facilities and attended Antenatal care (ANC) services. Only 17% attended once, and 20% attended twice, while 12% attended their first antenatal care services. It revealed a high- level use of Antenatal Care (ANC) services. In Figure 4, Barangay Tayud had the highest number of pregnant women who availed of Antenatal Care (ANC) services among the different barangay health centers. It is the highest income barangay with 476.159 hectares (Local Government Office Tayud) and the highest population in the Municipality of Consolacion, with 23,208 as determined by the 2020 Census. It represented 15.68% of the total population of Consolacion (PSA, 2021). It is known for its active economic trend with numerous factories, warehouses, and shipyards. There was a significant difference between sample medians of the different barangay health centers (Table 2).

Table 2. Result in Kruskall-Wallis test analysis of ANC utilization in Consolacion, 2021

Lamac	Jugan	Pob Occidental	Pitogo	Cansaga	Casili	Pulopogan	Pob Oriental	Danglag	Nangka	Tayud
		0.0004185						4.424E-05	0.001213	3.682E-10
		0.0005315						5.969E-05	0.0002899	1.392E-10
0.0004185	0.0005315				8.714E-07	0.001979	0.03246	0.02052	1.389E-06	2.827E-11
					0.01749			0.01004	0.0002838	1.926E-10
								0.5767	0.001019	6.476E-10
		8.714E-07	0.01749					2.98E-08	0.002118	2.525E-10
		0.001979						0.0002912	0.0001468	1.312E-10
		0.03246						0.00132	0.0001912	1.572E-10
4.424E-05	5.969E-05	0.02052	0.01004		2.98E-08	0.0002912	0.00132		1.582E-07	2.799E-11
0.001213	0.0002899	1.389E-06	0.0002838	0.001019	0.002118	0.0001468	0.0001912	1.582E-07		1.053E-07
3.682E-10	1.392E-10	2.827E-11	1.926E-10	6.476E-10	2.525E-10	1.312E-10	1.572E-10	2.799E-11	1.053E-07	

Raw p values, uncorrected significance

Figure 4. ANC utilization rate of the respondents in Consolacion, 2021.

Determinant factors affecting ANC utilization

Predisposing Factors: Figure 5 indicated that age (27-35 years old), education (high school graduate), marital status (married), occupation (privately employed and unemployed), and religion (Catholic) influenced ANC utilization among pregnant women. The first component (PC1), which is 44.1%, represented the maximum variance direction in the data, and the second component (PC2), which is 13.6%, reflected the second largest source of variation in the data. It could sum up to 57.7%, which can be good data and standard data in PCA.

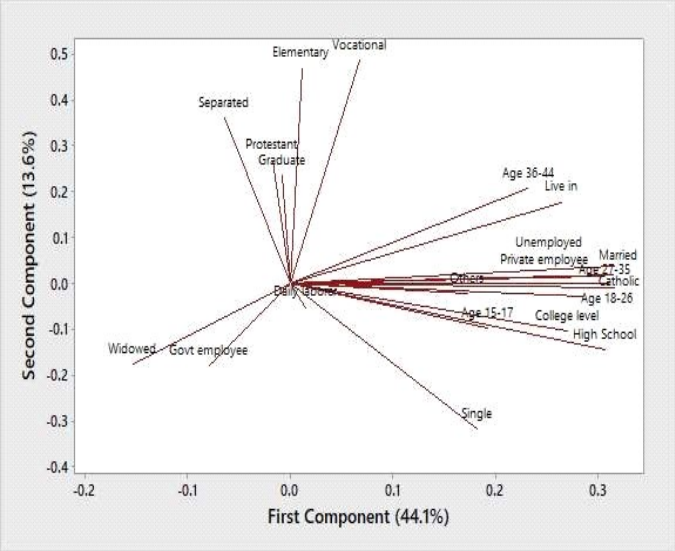

Figure 5. PCA Result of ANC Utilization in Consolacion, 2021.

Most of the respondents were 18-26 years old (42%) and 27-35 years old (42%). Age significantly influenced the frequency of ANC visits, and it paralleled the studies of Babalola, 2014 and Adewuyi *et al.* 2018). It also complemented the research of Doku *et al.* (2012), women aged 25-34 years old had a higher probability of having early ANC visits, and with what was found by Chubike and Constance (2013), where mothers between the ages of 25 and 34 had the highest ANC attendance. Pregnant women at this age had an attitude and responsible decisions about their health (Tsala Dimbuene *et al*. 2017; Osamor and Grady, 2016) to realize the effectiveness of ANC. Also, they were prone to some risk of complications, wherein they tend to develop high blood pressure during pregnancy. Several studies found that older women were likely to have at least four ANC visits compared with younger counterparts (Ononokpono and Azfredrick, 2014; Gupta *et al*., 2015; Worku and Woldesenbet, 2016; Anchang-Kimbi *et al*., 2014; Saad-Haddad *et al*., 2016; Rurangirwa *et al*., 2017; Adewuyi *et al*., 2018; Ayalew and Nigatu, 2018). Moreover, Joshi *et al.* (2014) also found older age to be positively associated with ANC attendance. The higher number of pregnant women were high school graduates (52%), 22% went to college, and 13% were able to graduate and had a degree. Education influenced ANC utilization, and it corresponded to the findings of Babalola, 2014; Rossier *et al*., 2014; Caliskan *et al*., 2015; Tsala Dimbuene *et al*., 2017; Parker and Reinke, 1983; Monteith *et al*., 1987; Warren *et al*., 1987; Rutstein, Sommerfelt and Schoemaker, 1990; Canovas, 1991; Nyarambi *et al*. 2019; Mehari *et al*. 2013; Munsur *et al*. 2010. Education made women aware of the effects of poor health and understood the demand and utilization of health care (Rahman *et al*. 2008). In a study in Metro Cebu, Philippines (Becker *et al*., 1993), the level of maternal education was the most consistent and important determinant of the use of these health services in both urban and rural areas.

Most pregnant women were married (30%) and lived together with partners (30%), while 18% were single or unmarried. Marital status

influenced maternal health and was consistent with Denny *et al*. (2022), in having four or more ANC visits among working women, and Wulandri *et al*. (2020), where marital status influenced the completeness of ANC among childbearing age women. In addition, findings from Sakeah *et al*. (2017); Ziblim, Yidana, and Mohammed (2018) showed a significant association between marital status and ANC utilization, with the influence and support of the husband and their positive previous experiences to realize the importance of ANC. The majority of the pregnant women were unemployed (58%), and 27% worked in private companies. The occupation of women had a significant effect on service utilization. It was in keeping with the findings of studies carried out in the Philippines (Kozhimannil *et al*. 2009), Yakong *et al*. (2010), Agunwa *et al*. (2017), Jeffery 2010, Koski *et al*. (2011). The majority of the pregnant women were unemployed and fulfilled the role of housewife. Utilization rates of ANC were highest among the unemployed. They were financially unstable and wanted to avail the free services of ANC. It supported previous findings on the influence of financial barriers on the utilization of maternal health care (MCH) services (Ameh *et al*., 2012). Unemployment and pregnancy outcomes were markers of socioeconomic status, a potential marker of stress, and an indicator of poor physical or mental health (Raatikainen *et al*., 2006).
In general, most pregnant women were Catholics (84%). Religion had an association with the utilization of antenatal care. Several studies had cited (Babalola, 2014; Mazalale *et al*., 2015; Dickson, Adde, and Amu, 2016; Abosse, 2010; Fekede, 2007; Dairo and Owoyokun, 2010) as a determinant of ANC use. Religious values and practices had a strong influence on the health of maternal women. Pregnant women and women in labor exhibited their faith (Aziato *et al*., 2016) and held some traditional health beliefs and attitudes regarding pregnancy and childbirth and those beliefs that benefited them. During pregnancy, women intensify their prayers to God for protection, safe delivery, and blessings (Jesse, 2007), and it is associated with more favorable pregnancy outcomes (Najman *et al*., 1988; Gyimah *et al*., 2006; Hebert *et al*., 2007; Chiswick & Mirtcheva, 2010). In the Philippines, Filipinos believe that there is nothing to lose if they abide with these beliefs that were derived from traditions, customs, and culture (Siojo, 2016).

Enabling Factors: Shorter distance to the health facility (Tarekegn *et al*.,2014; Fisseha *et al*., 2017; Tsegay *et al*., 2013; Girmaye and Berhan, 2016), wherein pregnant women had easy access to the barangay health clinics, was significantly associated with the utilization of services due to reduced costs of traveling to the clinic or hospital (Nyarambi, 2019). Since they also provided health services to malnourished children and senior citizens, there was a shortage of health care providers (Heywood, 2009) in the barangay health centers, unavailability of health facilities (Hijazi, 2018), the need for equipment like BP apparatus and stethoscope, some tables, and more chairs, and long waiting time (Kifle *et al*., 2017; Njozi *et al*., 2014), during prenatal check-ups were significantly associated with the utilization of ANC services.

Need factors: Pregnant women will not attend ANC if the quality of services is perceived as poor or negative experiences (de Masi *et al*., 2017). Research studies by Berhan (2014) and Dhaher *et al*. (2008) showed that individual attitudes towards health care providers, and perceptions of the quality services provided in health facilities, were mentioned as influencing factors for maternal health service. Good relations with health staff may feel more supported to ask questions and talk about their reproductive concerns and problems (Sharan and Valente, 2002). The abusive attitude of staff may negatively influence ANC attendance (Bermita *et al*., 2013; Ejigu *et al*., 2013; Ndwiga *et al*., 2013).

Maternal health services: There was a provision of quality prenatal care by the nurse/midwife in charge in each barangay health center. An interview with the midwife in charge of Barangay Poblacion Occidental Health Center mentioned that Antenatal Care for pregnant women should be initiated in the first trimester of pregnancy. To avail of Antenatal Care services, they requested to submit themselves for laboratory procedures such as Complete Blood Count (CBC) Test, Urine Analysis Test, Ultrasound, and Stool Exam. The Antenatal care services include monitoring the blood pressure and height and weight measurement among pregnant women. A Doppler ultrasound is done every three months during pregnancy to check for the fetal heartbeat.
Additional services provided during the Antenatal Care include Tetanus injection on the 4th or 5th month of pregnancy, recommended having two doses of Tetanus injection. Other services given were Deworming during the 5th month of pregnancy, HIV injection during pregnancy, if tested positive on HIV screening test, and Swab test for COVID 19 during the 9th month of pregnancy. Pregnant women can also avail free dental checkups at the Consolacion main health center. Pregnant women were also provided free vitamins (Ferrous sulfate) and Calcium by the barangay health centers.

As stated by the midwife in charge of Barangay Tayud Health Center, the provision of ANC to pregnant women was two times a month. They conducted advocacy lectures about health and nutrition every Monday of the month to a batch of pregnant women. They organize monthly training and lectures about Hypertension, Diabetes, HIV, and Syphilis and conduct HIV and Syphilis screening tests for pregnant women. They also held monthly training on diagnostic tests and newborn screening tests for pregnant women. They did follow-ups and home visits to pregnant women who didn't attend their scheduled ANC. The health workers attended training, had certificates, and trained for life support services. There was a long waiting time for prenatal check-ups, the health facility was overcrowded since it's temporary, and a health center in the barangay is still under construction. The LGU had supported good health facilities, medical support, and sufficient supplies to the barangay health centers. They also provided an adequate number of qualified health personnel since they had definite roles and responsibilities to ensure health in the community. They accommodated the advocacy of the different barangay health centers by providing posters whenever there were health programs, snacks, and T-shirts. The health personnel and health volunteers availed themselves of free transportation of barangay vehicles during events connected with the health center activities. Together with the local government officials, they had plans to provide things like diapers, clothes for babies, and other necessities essential for the baby to those pregnant women who completed their ANC and had delivered the baby as part of postpartum services.

SUMMARY/CONCLUSION

Summary: The accessibility of antenatal care services and determinant factors are vital to the maternal health conditions of pregnant women. Hence, this study aims to assess the factors affecting pregnant women in Consolacion, Cebu. Collection of data from 353 pregnant women between 15 to 45 years old who attended antenatal care (ANC) services from the 11 barangay health centers in Consolacion, Cebu. Information was gathered from the records of antenatal care clinic cards of pregnant women who availed Antenatal care services and information from the interviews of pregnant women using a survey questionnaire and interviews with barangay health personnel. The majority of the pregnant women had frequently visited barangay health facilities and attended Antenatal care services. It revealed a high-level use of Antenatal Care services. Most of the respondents belonged to the group of 18 - 26 years old and 27 – 35 years old. Age significantly influenced the frequency of ANC visits, where older women had the highest ANC attendance. Pregnant women at this age had an attitude and were responsible enough to understand the effectiveness of ANC. Also, they were prone to some risk of complications, wherein they tend to develop high blood pressure during pregnancy. The higher number of pregnant women were high school graduates. Education influenced ANC utilization and made women aware of the effects of poor health and understanding of the demand and utilization of health care. The majority of the pregnant women were married. Marital status influenced maternal health, with the support and influence of the husband and their positive previous experiences to realize the effectiveness of ANC. Most pregnant women were unemployed. The occupation of women had a significant effect on service utilization. Utilization rates of ANC were

highest among the unemployed. They were financially unstable and wanted to avail the free services of ANC. Generally, pregnant women are Catholics (84%). Religion had an association with the utilization of antenatal care. Religious values and practices had a strong influence on the health of maternal women. Their religious beliefs and faith had a role in coping with the difficulties during pregnancy and combined with prayers for protection, safe delivery, and healthy pregnancy outcomes. This study associated age, education, marital status, occupation, and religion were significant factors and had a strong influence on ANC utilization among pregnant women in the different barangay health centers of Consolacion. This research study would like to commend strengthening the implementation and regulation of Antenatal Care health care system policies and services and need to be part of every program in the local government units. The provision of adequate numbers of well-trained and skilled health professionals and the availability of sufficient equipment and supplies at the health facilities to improve available health services.

CONCLUSION

This study had associated age (42%), education (52%), marital status (30%), occupation (58%), and religion (84%) were significant factors and had a strong influence on ANC utilization among pregnant women in the different barangay health centers of Consolacion. The majority of the pregnant women (51%) had frequently visited barangay health centers and attended ANC services. It revealed a high-level utilization of ANC services. Then, it had determined that the utilization of Antenatal care services was found high in the Barangay Tayud health center. The barangay health care personnel were able to provide quality care services. Most expectant mothers had received adequate quality prenatal care. So, the prevalence of good prenatal care and desired optimal health care process was perceived appropriately among pregnant women who attended and availed themselves of Antenatal care services. Good maternal health care is a major contributing factor to a healthy pregnancy and safer delivery.

RECOMMENDATION

This research study would like to commend strengthening the implementation and regulation of Antenatal Care (ANC) health care system policies. Further counseling pregnant women about healthy habits and lifestyles to prepare for childbirth and child- rearing. In addition, formal education programs among pregnant women regarding awareness of maternal health promotion, risk identification, and management of pregnancy-related diseases, and access to services that support behavioral health conditions in achieving positive health outcomes. Moreover, prenatal diagnostic and screening tests for all pregnant women need to be part of every program in the local government units. Home visits and follow-ups and providing empowerment opportunities to pregnant women are vital. Providing transportation and communication support services can improve access to maternal health services. Telehealth/ Telemedicine enables pregnant women to seek consultation (e-consults) via phone calls or video chat. In this way, they can speak with doctors and health care professionals to seek assistance and provide counseling and monitoring services at any time of the day via phone calls and online inquiries. Moreover, the provision of adequate numbers of well-trained and skilled health professionals and having sufficient equipment and supplies at the health facilities are necessary to improve available health care services.

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