

HEALTH LITERACY OF PREGNANT WOMEN ABOUT SCREENING FOR HIV, SYPHILIS AND HEPATITIS B IN JAYAPURA CITY

Sherly Novita Mamoribo ^{1*}, Karel Batmanlusi ², Katarina L. Tuturop ³,
Agustina R. Yufuai ⁴ and Wahyuti ⁵

^{1,4,5} Specialization in Health Community Study Program of Public Health Science, Cenderawasih University, Indonesia.

^{1,4,5} Department of Health Promotion, Cenderawasih University, Indonesia.

² Department of Health Policy, Cenderawasih University, Indonesia.

³ Department of Epidemiology, Cenderawasih University, Jayapura Papua, Indonesia.

*Corresponding Author Email: sherlynovita101@gmail.com

DOI: [10.5281/zenodo.13739860](https://doi.org/10.5281/zenodo.13739860)

Abstract

The awareness and understanding of early screening for HIV, Syphilis, and Hepatitis B among women of reproductive age are crucial. Lack of this knowledge can lead to adverse outcomes, particularly in the transmission of sexually transmitted diseases. This study aims to examine the factors influencing the screening behavior of pregnant women. A quantitative cross-sectional study was conducted across 13 Community Health Centers over two months, involving 100 pregnant women selected through proportional stratified sampling. Data were collected using a questionnaire and analyzed using Chi-square tests. The study found significant relationships between knowledge levels and factors such as age (p-value = 0.027), income (p-value = 0.011), attitude (p-value = 0.000), PPIA (p-value = 0.005), and counseling (p-value = 0.026), with p-values < 0.05 indicating significance. However, no significant relationships were found with education (p-value = 0.634), employment (p-value = 0.719), parity (p-value = 0.938), antenatal care (p-value = 0.191), or access to information (p-value = 0.323).

Keywords: Health Literacy, Screening, HIV, Hepatitis B, Syphilis, Pregnant Women.

INTRODUCTION

Maternal health is a pivotal component in the broader strategy of developing human resources in Indonesia. As highlighted by President Joko Widodo in his "Indonesian Vision" speech, the focus on maternal and child health is crucial for the nation's future. Ensuring that mothers possess adequate knowledge, supported by various factors, is essential since informed individuals are more likely to adopt healthier behaviors. This is underscored by the "knowledge-action" model (Emilia Ova, 2008). According to the National PPIA Guidelines (Ministry of Health of the Republic of Indonesia, 2012), the risk of HIV transmission from mother to child increases over time, especially as more HIV-positive mothers are identified. Despite a relatively low transmission rate, the number of pregnant women with HIV has been rising, from 13,189 in 2012 to 16,191 in 2016. This has coincided with an increase in infant mortality due to AIDS, with the number of children under 15 years of age infected at birth or through breastfeeding rising from 4,361 in 2012 to 5,565 in 2016. The challenges posed by HIV and AIDS remain significant obstacles to achieving the Millennium Development Goals (MDGs), particularly Goal 6. These diseases not only impact public health but also have broader regional implications (Setiyawati Nanik, 2015).

According to the 2019 HIV/AIDS and STI Information System (SIHA) report by the Directorate General of P2P, HIV and AIDS cases are more prevalent in men than women, with 64.50% of HIV cases and 68.60% of AIDS cases reported in men in 2019. These findings align with gender-based HIV reports from 2008 to 2019, indicating that men are disproportionately affected (Indonesian Ministry of Health Data

and Information Center, 2020). Understanding the modes of transmission is critical for developing targeted interventions for pregnant women. A study conducted in Nampula, Mozambique, found that while knowledge of HIV transmission is generally high, awareness of Hepatitis B and C virus transmission is significantly lower. This study also established a correlation between literacy rates, socioeconomic status, and infection control, highlighting the importance of education and empowerment in combating these diseases (Chaquisse Eusebio, 2018).

The rise in congenital syphilis in the United States, with cases nearly quadrupling between 2015 and 2019, has alarmed public health experts (CDC, 2021). In Papua, the spread of HIV/AIDS remains a significant concern, with Jayapura City ranking second in the number of reported cases as of September 2020. By March 2021, Papua had reported 46,193 people living with HIV/AIDS, with Jayapura City accounting for 7,391 cases (Papua Provincial Health Service, 2021).

In 2022, only 39% of pregnant women in Papua were screened for HIV, a figure below the national standard of 58%. Additionally, syphilis testing revealed that 764 out of 6,111 pregnant women tested positive, with 690 receiving treatment (Routine Report Data from the Directorate of P2PM, 2022).

Hepatitis B (HBV) is a highly contagious virus, more so than HIV, transmitted through direct contact with infected blood or other bodily fluids. In Indonesia, 95% of hepatitis B transmission occurs from mother to child during childbirth. Since 2015, early detection of Hepatitis B in pregnant women has been a priority in primary healthcare settings (Kemenkes RI, 2017).

Syphilis, caused by *Treponema pallidum*, is a chronic, systemic infection that can be acquired or congenital. While most transmission occurs through sexual contact, nonsexual transmission is rare. Vertical transmission from mother to fetus can result in congenital syphilis (Ahmad M. et al., 2022).

The increasing incidence of a "triple elimination epidemic" underscores the importance of comprehensive PMTCT (prevention of mother-to-child transmission) strategies. These include preventing new infections, avoiding unintended pregnancies in women with syphilis, preventing vertical transmission, and providing adequate care and support for affected families (Bjekic M., Sipetić S., 2014).

METHODS

This descriptive correlation study, utilizing a cross-sectional design, was conducted to identify risk factors associated with pregnant women's knowledge of HIV, Syphilis, and Hepatitis B across 13 Jayapura City Health Centers (Notoatmodjo S., 2010). The study population comprised 2,206 pregnant women registered between January and April 2021. Using the Slovin formula and a 10% precision level, a sample size of 100 pregnant women was determined. Stratified random sampling was employed, with respondents distributed across the health centers. Data were collected via questionnaires assessing variables such as maternal age, education, occupation, income, parity, gestational age, access to information, knowledge, attitudes, PPIA understanding, and counseling services. Chi-square analysis was used to evaluate the relationships between these variables and maternal knowledge of HIV/AIDS, Syphilis, and Hepatitis B.

RESULT & DISCUSSION

A Community Health Center is a healthcare facility that provides both public health services and primary-level individual healthcare, with a strong emphasis on promotive and preventive measures to achieve the highest possible standard of public health within its jurisdiction (No.75, n.d.). Jayapura City is composed of five sub-districts, each of which is further divided into various primary healthcare units, known as community health centers, which serve as the frontline providers of basic health services to the local population. In the Muara Tami sub-district, there are two health centers: the West Koya Health Center and the Skow Mabo Health Center. The Abepura Regency is home to four health centers: Abepura Health Center, Abepantai Health Center, Waena Health Center, and Kota Raja Health Center. The Heram Regency contains one Community Health Center, specifically the Hebebhulu Yoka Community Health Center. South Jayapura Regency is served by three Community Health Centers: Hamadi Community Health Center, Elly Uyo Community Health Center, and Twano Community Health Center. Lastly, North Jayapura Regency has three health centers: North Jayapura Health Center, Tanjung Ria Health Center, and Imbi Health Center.

1. Results of Univariate Analysis of Respondent Characteristics

Table 1: Characteristics of Respondents in Jayapura City

Characteristics	sample	percent
Age		
≤19 year	13	13
20 - 24 year	49	49
25 – 29 year	19	19
30 – 34 year	12	12
≥ 35 year	7	7
Amount	100	100
Education		
No School	1	1
Elementary School	3	3
Junior High School	11	11
High school or vocational high school	62	62
College	23	23
Amount	100	100
Work		
House wife	84	84
Government employees	5	5
Businessman	4	4
Private employees	4	4
Trader	2	2
Laborer	1	1
Amount	100	100
Income		
<1.000.000	35	35
1.000.000-2.000.000	23	23
2.100.000-3.000.000	21	21
>3.000.000	21	21
Amount	100	100
Parity		
Primipara	28	28
Multiparous	68	68
Grandemultiparous	4	4

Amount	100	100
Ante Natal Care (ANC)		
Trimester 1 (1 s.d 12 week)	36	36
Trimester 2 (13 s.d 27 week)	38	38
Trimester 3 (28 s.d 41 week)	26	26
Amount	100	100
Knowledge		
Not Enough	51	51
Good	49	49
Amount	100	100

Table 1 indicates that among the 100 respondents, the largest group consisted of 49 individuals aged 20-24 years (49 percent). The highest level of maternal education was found to be at the high school or vocational school level, with 62 respondents (62 percent). A majority of the pregnant women, 84 individuals (84 percent), were primarily engaged in managing household responsibilities. Regarding family income, 35 respondents (35 percent) reported earning less than 1,000,000 per month. The majority of respondents, 68 individuals (68 percent), were multiparous, and 38 pregnant women (38 percent) had their ANC check-ups predominantly during the second trimester.

2. Results of Bivariate Analysis of Research Variables

Table 2: Bivariate analysis of determinants and screening of respondents in Jayapura City

Variable	Knowledge of HIV/AIDS, Syphilis & Hepatitis				Amount		P-value	CI(Upper-Lower)
	Not Enough		Good		n	%		
	n	%	n	%				
Age								
Teenager	37	60,7	24	39,9	61	100	0,027	2,753 (1,198-6,325)
Mature	14	35,9	25	64,1	39	100		
Education								
Low	9	60,0	6	40,0	15	100	0,634	1,536
Tall	42	49,4	43	50,6	85	100		(0,503-4,693)
Work								
Doesn't work	44	52,4	40	47,6	84	100	0,719	1,414 (0,482-4,150)
Work	7	43,8	9	56,3	16	100		
Income								
Low	46	58,2	33	41,8	79	100	0,011	4,461
Tall	5	23,8	16	76,2	21	100		(1,486-13,390)
Parity								
Risky	17	53,1	15	46,9	32	100	0,938	1,133
Not Risky	34	50,0	34	50,0	68	100		(0,489-2,629)
Antenatal Care								
Risky	29	45,3	35	54,7	64	100	0,191	0,527
Not Risky	22	61,1	14	38,9	36	100		(0,230-1,211)
Access information								
Never	17	60,7	11	39,3	28	100	0,323	1,727 (0,710-4,199)
Once	34	47,2	38	52,8	72	100		
Maternal attitudes regarding HIV testing, Syphilis Hep B								
Does not support	23	92,0	2	8,0	25	100	0,000	19,304
Support	28	37,3	47	62,7	75	100		(4,227-88,152)

PPIA								
Do not understand	25	71,4	10	28,6	35	100	0,005	3,750 (1,547-9,090)
understand	26	40,0	39	60,0	65	100		
Counseling								
Don't agree	38	60,3	25	39,7	63	100	0,026	2,806
Agree	13	35,1	24	64,9	37	100		(1,208-6,518)

Table 2 reveals that among the 61 adolescent respondents, 37 individuals (60.7%) possessed good knowledge, while 24 (39.3%) exhibited poor knowledge. Of the 39 adult respondents, 14 individuals (35.9%) had poor knowledge, and 25 (64.1%) demonstrated good knowledge. The analysis of the correlation between age and knowledge produced a p-value of 0.027, which is below α (0.05), indicating a statistically significant relationship between age and the knowledge of pregnant women. The RP value of 2.753 (95% CI: 1.198 – 6.325) suggests that adolescent pregnant women are 2.753 times more likely to have limited knowledge about HIV/AIDS, Syphilis, and Hepatitis B compared to their adult counterparts.

Regarding educational attainment, among the 15 respondents with lower education levels, 9 individuals (60.0%) had poor knowledge, and 6 (40.0%) had good knowledge. Among the 85 respondents with higher education levels, 42 individuals (49.4%) had poor knowledge, while 43 (50.6%) displayed good knowledge. The p-value for the relationship between maternal education and knowledge was 0.634, exceeding α (0.05), indicating no statistically significant association between education and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. The RP value of 1.536 (95% CI: 0.503 – 4.693) implies that mothers with lower education levels are 1.536 times more likely to have inadequate knowledge compared to those with higher education.

Among the respondents, 44 unemployed mothers exhibited poor knowledge, while 40 (47.6%) employed mothers had good knowledge. Conversely, 7 employed mothers (43.8%) had poor knowledge, and 9 (56.3%) had good knowledge. The p-value for the relationship between maternal occupation and knowledge was 0.719, which is greater than α (0.05), indicating no statistically significant relationship between occupation and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. The RP value of 1.414 (95% CI: 0.482 – 4.150) suggests that pregnant women without employment are 1.414 times more likely to have limited knowledge compared to those who are employed.

Regarding income, 46 mothers with lower incomes (58.2%) exhibited poor knowledge, while 33 (41.8%) had good knowledge. On the other hand, 5 mothers with higher incomes (23.8%) had poor knowledge, and 16 (76.2%) had good knowledge. The p-value for the relationship between maternal income and knowledge was 0.011, which is below α (0.05), indicating a statistically significant association between income and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. The RP value of 4.461 (95% CI: 1.486 – 13.390) suggests that pregnant women with lower incomes are 4.461 times more likely to have inadequate knowledge compared to those with higher incomes.

Among respondents with at-risk parity, 17 mothers (53.1%) had poor knowledge, while 15 (46.9%) had good knowledge. For those with non-risk parity, 34 mothers (50.0%) had poor knowledge, and 34 (50.0%) had good knowledge. The p-value for the relationship between maternal parity and knowledge was 0.938, which is greater than

α (0.05), indicating no statistically significant relationship between parity and the knowledge of pregnant women. The RP value of 1.133 (95% CI: 0.489 - 2.629) suggests that parity serves as a protective factor in enhancing maternal knowledge.

Pregnant women who attended their first ANC visit during the second and third trimesters were at risk of having limited knowledge, with 29 individuals (45.3%) showing poor knowledge and 35 (54.7%) demonstrating good knowledge. Among those who attended their first ANC visit during the first trimester, 22 mothers (61.1%) had poor knowledge, while 14 (38.9%) had good knowledge. The p-value for the relationship between ANC timing and knowledge was 0.191, greater than α (0.05), indicating no statistically significant relationship between ANC timing and maternal knowledge. The RP value of 0.527 (95% CI: 0.230 - 1.211) suggests that the timing of ANC is a protective factor in improving maternal knowledge.

Respondents who had never accessed information about HIV, Syphilis, and Hepatitis B demonstrated poor knowledge, with 17 individuals (60.7%) showing poor knowledge and 11 (39.3%) displaying good knowledge. Among those who had accessed information, 34 mothers (47.2%) exhibited poor knowledge, while 38 (52.8%) had good knowledge. The p-value for the relationship between access to information and knowledge was 0.323, which is greater than α (0.05), indicating no statistically significant relationship between access to information and maternal knowledge. The RP value of 1.727 (95% CI: 0.710 - 4.199) suggests that mothers who have never accessed information are 1.727 times more likely to have limited knowledge compared to those who have accessed information.

Mothers with an unsupportive attitude towards testing for HIV, Syphilis, and Hepatitis B exhibited poor knowledge, with 23 individuals (92.0%) showing poor knowledge and 2 (8.0%) displaying good knowledge. Among mothers with a supportive attitude, 28 individuals (37.3%) had poor knowledge, while 47 (62.7%) had good knowledge. The p-value for the relationship between attitude and knowledge was 0.000, which is below α (0.05), indicating a statistically significant association between attitude and knowledge. The RP value of 19.304 (95% CI: 4.227-88.152) suggests that mothers with an unsupportive attitude towards testing are 19.304 times more likely to have inadequate knowledge compared to those with a supportive attitude.

Among respondents who did not understand PPIA services at the Community Health Center, 25 mothers (71.4%) had poor knowledge, while 10 (28.6%) demonstrated good knowledge. Among those who understood PPIA services, 26 mothers (40.0%) exhibited poor knowledge, while 39 (60.0%) displayed good knowledge. The p-value for the relationship between understanding of PPIA services and knowledge was 0.005, which is below α (0.05), indicating a statistically significant relationship between PPIA services and maternal knowledge. The RP value of 3.750 (95% CI: 1.547 - 9.090) suggests that mothers who do not understand PPIA services are 3.750 times more likely to have limited knowledge compared to those who understand these services.

With regard to counseling, 38 mothers (60.3%) who did not agree with counseling exhibited poor knowledge, while 25 (39.7%) had good knowledge. Among those who agreed to counseling, 13 mothers (35.1%) demonstrated poor knowledge, while 24 (64.9%) exhibited good knowledge. The p-value for the relationship between counseling and knowledge was 0.026, which is below α (0.05), indicating a statistically significant relationship between counseling and maternal knowledge. The RP value of

2.806 (95% CI: 1.208-6.518) suggests that mothers who do not agree with counseling are 2.806 times more likely to have inadequate knowledge compared to those who agree to counseling.

DISCUSSION

Among the 100 pregnant women surveyed, a significant proportion held incorrect beliefs regarding HIV transmission: 73% believed HIV could be transmitted via insects (such as mosquitoes), 61% thought it could spread through sharing a pillow with an HIV-positive person, 67% believed using shared eating utensils could result in transmission, 64% thought HIV could be contracted through shaking hands, 71% believed contact with sweat could transmit the virus, and 73% thought hugging or swimming with an HIV-positive person posed a transmission risk.

The study by Alomair, Alageel, Davies, and Bailey (2020), titled "Knowledge about Sexually Transmitted Infections and Attitudes among Muslim Women Worldwide," used a systematic review to highlight widespread myths and misconceptions among Muslim women regarding STI transmission. The study found that many women mistakenly believed that STIs could be transmitted through mosquito bites, with this belief ranging between 18% and 58%. Other misconceptions included the belief that STIs could be contracted through sharing toilets, swimming in the same pool, or engaging in physical contact such as shaking hands or hugging.

Contrary to these misconceptions, HIV is not transmitted through saliva, sweat, urine, or feces, nor through insect bites, as HIV can only survive within the human body. These findings align with those of Shaluhayah, Mustofa, and Widjanarko (2015), in their study on community stigma towards individuals with HIV/AIDS. Their research revealed that nearly half of the respondents (49.7%) held negative attitudes towards individuals with HIV. This stigma manifested in various forms, such as refusal to consume food prepared or sold by HIV-positive individuals, prohibiting children from playing with HIV-positive peers, avoiding the use of shared toilets, and even refusing to live near someone showing symptoms of HIV/AIDS. Within families, there was a reluctance to sleep in the same room as an HIV-positive member or to perform caregiving tasks such as preparing food, cleaning utensils, or sitting close to an infected individual.

Quoting from Herek, Capitanio, Widaman (2002), and Djoerban (1999) in Shaluhayah et al. (2015), the study emphasized that a person's knowledge about HIV/AIDS significantly influences their attitudes towards those living with the disease. Stigma often arises from ignorance about HIV transmission mechanisms and is further fueled by the widespread HIV/AIDS epidemic. Misunderstanding or lack of awareness about HIV/AIDS often leads to fear and rejection of those infected. Therefore, providing comprehensive information through counseling, education, or socialization is crucial in reducing stigma.

Behavioral factors are the second most significant influence on health, after environmental factors (Blum, 1974). To improve public health, it is strategic to target these behavioral factors through interventions. These can be enforced through regulations that compel healthy behavior or encouraged through educational approaches, including persuasion, appeals, and the provision of information to raise awareness (Notoatmodjo, 2010).

Respondents also demonstrated a lack of understanding of HIV prevention measures. For instance, 52% did not believe it was necessary to consider the screening results of blood donors for HIV, Syphilis, and Hepatitis B, 69% did not prioritize the use of sterile needles, and 54% underestimated the importance of condoms as a contraceptive method. Furthermore, 56% of respondents incorrectly believed that avoiding unwanted pregnancies in HIV-positive women was unnecessary, and 63% were unaware that performing a cesarean section on an HIV-positive mother could reduce the risk of transmitting the virus to the child. Additionally, 63% thought that counseling was only necessary after an HIV test, not before.

These findings are consistent with the study by Setiyawati and Meilani (2015), titled "Determinants of HIV Testing Behavior in Pregnant Women." They found that, while most respondents had good general knowledge about HIV, there were critical gaps in their understanding. For example, 66% did not know that HIV could be transmitted during childbirth, 65% were unaware that HIV-positive pregnant women should deliver via cesarean section, and 90.7% believed that simply undergoing a pregnancy examination was sufficient to determine their HIV status.

Despite these gaps, respondents did demonstrate some understanding: 67% and 61% had a good grasp of what HIV and AIDS are, respectively, 68% understood the virus that causes AIDS, and 93% acknowledged that HIV/AIDS is a disease to be avoided. Additionally, 78% were aware that HIV could be transmitted through unprotected sexual intercourse with an HIV-positive partner, 81% recognized the importance of avoiding multiple sexual partners, 78% understood the need for regular pregnancy check-ups, 61% knew that HIV-positive mothers should avoid exclusive breastfeeding, 75% recognized the importance of voluntary HIV testing to prevent mother-to-child transmission, and 65% were aware of the HIV transmission prevention programs available at Health Centers.

According to Green's theory (1980), education and knowledge are key predisposing factors that influence behavior. Ideally, higher levels of education and knowledge lead to more positive health behaviors. Health promotion efforts aim to ensure that individual, group, or community behaviors positively impact health maintenance and improvement.

The research data also indicated that 62% of respondents incorrectly believed that Hepatitis B is not a contagious liver disease caused by the Hepatitis B virus (HBV), and 51% were unaware that a person is diagnosed with Hepatitis B through a laboratory serology test that shows a reactive HBsAg result. Furthermore, low percentages of respondents correctly identified Hepatitis B transmission risks: 60% did not recognize that the virus could be transmitted through contact with infected blood, 62% were unaware of transmission through semen and vaginal fluids, 58% did not recognize the risk from contaminated syringes, 83% underestimated the risk from ear piercing, 60% were unaware of the risk from blood transfusions, and 66% did not know that an infected mother could transmit the virus to her baby during childbirth.

The study conducted by Chaquisse Eusebio et al. (2018) emphasizes the critical need to assess pregnant women's understanding of infection transmission to better tailor programs to their specific needs. Their research, carried out in Nampula, Mozambique—an area with a high risk for sexually transmitted infections—revealed that while awareness of HIV transmission was generally high, persistent misconceptions remained, and knowledge about Hepatitis B (HBV) and Hepatitis C

(HCV) transmission was significantly lacking. The study also identified a significant correlation between knowledge levels and socioeconomic status, highlighting the necessity of education and empowerment as key components of a comprehensive strategy to prevent infections.

It is recommended that all pregnant women undergo testing for the Hepatitis B surface antigen (HBsAg) during each pregnancy. Those who test positive should receive further testing for HBV DNA, and if their viral load exceeds 200,000 IU/mL, antiviral therapy should be initiated to prevent perinatal transmission. For infected pregnant women, transmission to the infant can be prevented by administering Hepatitis B immune globulin (HBIG) and the Hepatitis B vaccine (administered in separate limbs) within 12 hours of birth, followed by the completion of the 3-dose vaccine series (CDC, 2021). The research further revealed that 62% of pregnant women incorrectly identified the cause of syphilis transmission, and 56% erroneously believed that syphilis could not be transmitted from mother to fetus during pregnancy.

Since 2012, the number of reported cases of congenital syphilis (CS) in the United States has consistently increased, with a 291% rise in the CS rate, from 12.4 to 48.5 cases per 100,000 live births between 2015 and 2019. Preventing CS relies on the screening and treatment of pregnant women diagnosed with syphilis. Many states have mandated syphilis testing during pregnancy, and these policies may help address the rising CS rates by ensuring broader screening (CDC, 2021).

The sharp increase in congenital syphilis cases in the United States, which nearly quadrupled between 2015 and 2019, is of particular concern. Public health officials are alarmed by this trend (CDC, 2021). It is crucial that all pregnant women undergo serological screening for syphilis during their first prenatal visit, as required by most states. In populations with less optimal prenatal care outcomes, serologic screening and treatment (if reactive) should be conducted during prenatal testing. This screening can be performed using either traditional nontreponemal antibody tests (e.g., RPR) or treponemal antibody tests (e.g., immunoassays) through reverse sequence algorithms.

Ideally, syphilis screening should be conducted at the first prenatal visit during the first trimester. Early diagnosis and treatment are vital to preventing congenital syphilis and its complications, such as stillbirth. Penicillin G continues to be effective in preventing transmission from mother to fetus and in treating both fetal and maternal infections. Women residing in areas with high syphilis morbidity or those at higher risk should be rescreened early in the third trimester and again at delivery (CDC, 2021).

Risk factors for syphilis during pregnancy include having multiple sexual partners, engaging in drug-related or transactional sex, delayed or absent prenatal care, methamphetamine or heroin use, incarceration of the woman or her partner, and unstable housing or homelessness. Healthcare providers should also inquire about ongoing risky behaviors and the treatment of sexual partners to assess the risk of reinfection (CDC, 2021).

Finally, it is advised that all pregnant women undergo HIV testing as early as possible, preferably at their first prenatal visit. Early HIV diagnosis and treatment with antiretroviral therapy (ART) are crucial for preventing transmission and improving health outcomes for both the mother and child.

a. Testing the Relationship Between Maternal Age and Pregnant Women's Knowledge About HIV/AIDS, Hepatitis B, and Syphilis

The study's findings indicate a significant correlation between maternal age and pregnant women's knowledge of HIV, Syphilis, and Hepatitis B, with a p-value of 0.027, which is below α (0.05). This result is consistent with the research conducted by Dagnaw M, Million Y, Gizachew M, et al. (2020) in their study titled "Hepatitis B & C Viruses, Infection and Associated Factors among Pregnant Women Attending Antenatal Care in Hospitals in the Amhara National Regional State, Ethiopia." Their findings showed a significant association among younger women aged 17-25 years, with an RP value of 3.2 (95% CI, 1.8-8.6). Sociodemographic data indicated that younger and unmarried pregnant women were significantly associated with the prevalence of HBsAg. This may be due to higher levels of sexual activity in younger age groups compared to those aged 26 years and older. This observation aligns with other studies conducted in Gambella, Ethiopia. Conversely, other research reported a higher prevalence of HBsAg among older pregnant women. The Hepatitis B virus, which is highly contagious—100 times more so than HIV—is transmitted through infected blood, blood products, unprotected sexual contact, unsafe injections, tattoos, and vertically from mother to child before, during, or after birth. In endemic regions, mother-to-child transmission of HBV (MTCT) remains a major source of chronic infection. In Africa, approximately 70% to 90% of infants infected before their first birthday develop chronic HBV infections, leading to liver cirrhosis, hepatocellular carcinoma, and premature death. Prevention of MTCT is widely advocated, involving screening, early detection, initiation of treatment in pregnant women, and administering the HBV vaccine and Hepatitis B immunoglobulin (HBIG) within 24 hours to newborns of HBsAg-positive mothers.

The variable of gestational age (ANC) serves as a protective factor in both adolescence and adulthood (p-value = 0.005; RP = 0.241; 95% CI: 0.092-0.630), while the education variable (RP = 0.952; 95% CI: 0.310-2.921) and access to information variable (RP = 0.983; 95% CI: 0.402-2.405) show similar trends. This finding is in line with the study by Hamda G.S. (2020), which observed that the comprehensive and multifaceted HIV prevention and control efforts by the Government of Botswana likely contributed to a reduction in HIV incidence among younger age groups, particularly through the effective and robust PMTCT program.

b. Testing the Relationship Between Maternal Education and Pregnant Women's Knowledge About HIV/AIDS, Syphilis, and Hepatitis B

Statistical analysis using the Chi-square method for the maternal education variable and knowledge variable produced a p-value of 0.634, which is greater than α (0.05). This outcome indicates that there is no statistically significant relationship between maternal education and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. The RP value of 1.536 (95% CI: 0.503 - 4.693) suggests that mothers with lower education levels are 1.536 times more likely to have low knowledge compared to those with higher education. This result contrasts with the findings of Hamda G.S. (2020), who reported that pregnant women with lower education are disproportionately more likely to be infected with HIV. Women who were illiterate or had only a primary education were over eight times more likely to be at risk of HIV infection (AOR = 8.45; 95% CI: 1.8-39.1) compared to those with higher education, while those with

secondary education had more than four times the risk (AOR = 4.01; 95% CI: 2.1-7.8) compared to those with high school education.

Table 4.2 indicates that out of 15 respondents, nine (60.0%) with lower education had poor knowledge, while six (40.0%) had good knowledge. Conversely, among 85 respondents, 42 (49.4%) with higher education had poor knowledge, and 43 (50.6%) had good knowledge. The study by Nath A. (2021) revealed that more than a third of the participants had completed high school (38.6%), while 33.9% of their partners had completed pre-university or diploma-level education. This finding aligns with Wiwin's (2011) study, cited in Herlinda (2017), which showed that nearly all highly educated pregnant women (93.3%) had a good frequency of ANC visits, with only one (6.7%) reporting a low frequency.

Research by Temesgen A.B. and Andamlak D.E. (2020) explored the relationship between the education level of pregnant women and the seroprevalence of HBsAg, HCV, and HIV. Among the 10 HBsAg-reactive subjects, nearly all (90%) had formal education, while the remainder did not. Only one pregnant woman without formal education tested seropositive for HBsAg, whereas most of the others (3.9%) had formal education (COR = 0.92; 95% CI = 0.38-2.24; $p = 0.852$). This finding suggests that education can significantly influence behavior, particularly in motivating individuals to engage in health development. Higher education levels facilitate the reception and application of information (Notoatmodjo S., 2010).

A crosstab analysis of the education variable with other variables identified as protective factors, such as age (RP = 0.952; 95% CI: 0.310-2.921), income (RP = 0.464; 95% CI: 0.139-1.545), parity (RP = 0.740; 95% CI: 0.216-2.534), and gestational age (RP = 0.592; 95% CI: 0.195-1.794), demonstrated no significant relationship between education and maternal knowledge. Although age is significantly related to knowledge (p -value = 0.027), it does not significantly correlate with maternal education, as the majority of young adult mothers aged 20-24 years (49%) had completed high school or vocational school (62%).

c. Testing the Relationship Between Maternal Occupation and Maternal Knowledge About HIV/AIDS, Syphilis, and Hepatitis B

Chi-square statistical tests for the maternal occupation variable and knowledge variable resulted in a p -value of 0.719, which is greater than α (0.05). This indicates that there is no statistically significant relationship between maternal occupation and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. The RP value of 1.414 (95% CI: 0.482 - 4.150) suggests that mothers who are not employed have a 1.414 times greater likelihood of possessing low knowledge compared to those who are employed. A study by Nath A., Venkatesh S., Balan S., et al. (2021) explored the relationship between anxiety and psychosocial factors, finding that the odds of anxiety were twice as high among women in the lower middle class (AOR = 2.804; 95% CI: 1.296–6.068; $p = 0.009$). Additionally, anxiety levels were significantly higher among women with low social support, as evidenced by both univariate and multivariate analyses (COR = 1.733; 95% CI: 0.945-3.178; AOR = 1.683; 95% CI: 0.925-3.064).

Table 4.2 shows that out of 84 respondents, 44 unemployed mothers (52.4%) had poor knowledge, while 40 (47.6%) had good knowledge. Among the 16 employed respondents, seven (43.8%) had poor knowledge, and nine (56.3%) had good knowledge. The study by Temesgen A.B. and Andamlak D.E. (2020) revealed that the prevalence of HBV infection was higher among housewives (3.6%; 8/222 or 80%;

8/10). Although the difference was not statistically significant, HIV-positive women had a higher likelihood of HBV infection (COR = 15.66; 95% CI = 6.96-121.75; $p = 0.199$).

A crosstab analysis of the occupation variable with other studied variables revealed that low income is 5.462 times more likely among unemployed pregnant women (p -value = 0.006; RP = 5.462; 95% CI = 1.739-17.155). Protective factors include gestational age (RP = 0.777; 95% CI: 0.247-2.445) and access to information sources (RP = 0.591; 95% CI: 0.192-1.818). These findings suggest that working mothers have better knowledge than unemployed mothers, likely due to their increased interaction with others, providing more opportunities to access information about their condition (Romauli, 2015).

d. Testing the Relationship Between Maternal Income and Maternal Knowledge About HIV/AIDS, Syphilis, and Hepatitis B

Table 4.2 indicates that among 79 respondents, 46 low-income mothers (58.2%) had limited knowledge, while 33 (41.8%) demonstrated good knowledge. Conversely, among 21 high-income respondents, five (23.8%) had limited knowledge, and 16 (76.2%) had good knowledge. Statistical analysis using the Chi-square method for the maternal income variable and knowledge variable resulted in a p -value of 0.011, which is less than α (0.05), indicating a statistically significant relationship between maternal income and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. A similar conclusion was drawn by Izadirad H., et al. (2021), who found that health literacy, self-efficacy, income, social support, and education level accounted for 7.5%, 4.6%, 2.6%, 1%, and 0.6% of the variance in prenatal care, respectively. The study identified income, prenatal care, insurance, health literacy, and social support as the most influential factors affecting birth weight outcomes (OR = 2.21, OR = 2.12, OR = 2, OR = 0.66, OR = 0.17). The findings suggest that a combination of health literacy, self-efficacy, and social support is crucial for improving prenatal care and birth weight outcomes among low-income pregnant women in Iran.

A crosstab analysis of the income variable with other studied variables reveals that unemployed mothers are 5.462 times more likely to have low income (p -value = 0.006; RP = 5.462; 95% CI = 1.739-17.155). Protective factors include education (RP = 0.464; 95% CI: 0.139-1.545) and gestational age (RP = 0.346; 95% CI: 0.106-1.123). The study further indicates that employed mothers possess better knowledge than unemployed mothers, likely due to their increased opportunities to access information through interactions with others (Romauli, 2015).

e. Testing the Relationship Between Parity and Maternal Knowledge About HIV/AIDS, Syphilis, and Hepatitis B

Table 4.2 indicates that among 32 respondents, 17 mothers (53.1%) with at-risk parity had limited knowledge, while 15 (46.9%) had good knowledge. Among 68 respondents, 34 mothers (50.0%) with non-risk parity had limited knowledge, and 34 (50.0%) had good knowledge. The Chi-square test for the maternal parity variable and knowledge variable resulted in a p -value of 0.938, which is greater than α (0.05). This indicates that there is no statistically significant relationship between maternal parity and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. The RP value of 1.133 (95% CI: 0.489 - 2.629) suggests that parity may act as a protective factor in enhancing maternal knowledge.

A crosstab analysis of the parity variable with other studied variables reveals that mothers in their adolescent and young adult years are 4.086 times more likely to experience risky parity. Protective factors include education (RP = 0.740; 95% CI: 0.216-2.534), gestational age (RP = 0.506; 95% CI: 0.213-1.202), PPIA (RP = 0.782; 95% CI: 0.319-1.914), and counseling (RP = 0.797; 95% CI: 0.336 - 1.890). Multipara mothers constitute 68% of the study population. This descriptive-analytic study, conducted on 860 primiparous pregnant women referred to a health care center in Iranshahr, Iran, found that pregnancies among women of advanced maternal age (35 years or older) or those with high parity (five or more births) are associated with higher rates of maternal and infant mortality. These pregnancies are often overlooked in current family planning and reproductive health programs.

f. Relationship Between ANC Access and Maternal Knowledge About HIV/AIDS, Syphilis, and Hepatitis B

Table 2. indicates that among 64 respondents, mothers who received ANC during the second and third trimesters had poor knowledge (45.3%; 29 individuals), while 54.7% (35 individuals) had good knowledge. Among 36 respondents, mothers who received ANC for the first time in the first trimester exhibited poor knowledge (61.1%; 22 individuals), whereas 38.9% (14 individuals) demonstrated good knowledge. The Chi-square test for the ANC variable and knowledge variable resulted in a p-value of 0.191, which is greater than α (0.05), indicating no statistically significant relationship between ANC and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. The RP value of 0.527 (95% CI: 0.230 - 1.211) suggests that ANC serves as a protective factor in enhancing maternal knowledge.

Women aged 20 years and living outside Nyanza and Nairobi were less likely to undergo testing compared to those residing in the Coastal areas, especially those with higher HIV-related stigma (OR: 0.83; 95% CI: 0.73-0.94; $p = 0.004$). This finding underscores the importance of culturally appropriate health education in improving the utilization of ANC services in resource-limited areas. Addressing HBV infection among pregnant women in Rwanda, as well as HBV-HIV coinfection, is crucial. Recognizing that HBV and HBV-HIV coinfection may be more prevalent among young urban women will aid in strengthening prevention, screening, and treatment efforts. Screening all pregnant women attending ANC services, particularly those who are HIV-positive, is recommended to prevent maternal transmission. The implementation of the HBV birth dose vaccination may reduce the HBV burden among adolescents (Mutagoma M., et al, 2017).

A crosstab analysis of the ANC variable with other studied variables identified protective factors such as age (p -value = 0.005; RP = 0.241; 95% CI: 0.092-0.630), education (RP = 0.592; 95% CI: 0.195-1.794), employment (RP = 0.777; 95% CI: 0.247-2.445), income (RP = 0.346; 95% CI: 0.106-1.123), parity (RP = 0.506; 95% CI: 0.213-1.202), access to information sources (RP = 0.542; 95% CI: 0.222-1.323), attitude (RP = 0.408; 95% CI: 0.162-1.030), and PPIA (RP = 0.767; 95% CI: 0.328-1.794). Adults are more likely than adolescents to undergo ANC examinations due to their physical, emotional, and psychological maturity, which enhances their awareness of the importance of pregnancy checks, even during the COVID-19 pandemic (Ariestanti et al, 2020).

Women with higher education are more likely to engage in ANC due to their awareness of its significance for maternal and child health. Even during a pandemic,

these women are more vigilant and take precautions, such as adhering to health protocols, when accessing ANC services (Riestanti et al, 2020). Health service providers or PPIA at Health Centers play a protective role in increasing maternal knowledge about HIV and screening. Public awareness, particularly among pregnant women, for voluntary ANC and screening is good, but stigma persists, necessitating health worker initiation.

g. Relationship Between Access to Information and Maternal Knowledge About HIV/AIDS, Syphilis, and Hepatitis B

Table 2. shows that among 28 respondents, 17 mothers (60.7%) who had never accessed information about HIV, Syphilis, and Hepatitis B had poor knowledge, while 11 (39.3%) had good knowledge. Among 72 respondents, 34 mothers (47.2%) who had received information had poor knowledge, while 38 (52.8%) had good knowledge. The Chi-square test for information access and knowledge variables resulted in a p-value of 0.323, which is greater than α (0.05), indicating no statistically significant relationship between information sources and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. The RP value of 1.727 (95% CI: 0.710 - 4.199) suggests that mothers who have never received information are 1.727 times more likely to have low knowledge compared to those who have. This finding is consistent with the research by Shaluhayah et al. (2015), which found no significant relationship between access to information about HIV/AIDS and stigma towards PLWHA (p-value = 0.638).

The study revealed that 72% of respondents had received information, while 28% had never accessed it. Most information was delivered by health workers (51%), while 81% had never accessed information through the media. The majority of respondents received HIV/AIDS-related information through television, followed by newspapers, radio, magazines, and the internet.

A crosstab analysis of the information access variable with other studied variables suggests that protective factors include age (RP = 0.983; 95% CI: 0.402-2.405), employment (RP = 0.591; 95% CI: 0.192-1.818), income (RP = 0.965; 95% CI: 0.332-2.804), and attitude (RP = 2.111; 95% CI: 0.809–5.512), indicating that mothers with unsupportive attitudes towards prevention efforts are 2.111 times more likely not to access information.

This study contrasts with findings by the CDC (2021), which demonstrated a significant relationship between HIV testing behavior and the availability of information sources from family (p-value = 0.045) and health cadres (p-value = 0.039). Research in Brazil highlighted a higher prevalence of HBsAg among pregnant women than expected for the region, as well as anti-HCV prevalence and susceptibility to Hepatitis B infection. The study emphasized the need for hepatitis B and C tracking during prenatal care, given current therapeutic advances and the mandatory completion of immunoprophylaxis in all newborns.

h. Relationship Between Attitudes Towards HIV Testing Services and Maternal Knowledge About HIV/AIDS, Syphilis, and Hepatitis B

The Chi-square test for maternal attitudes and knowledge variables yielded a p-value of 0.000, which is less than α (0.05). This indicates a statistically significant relationship between maternal attitudes and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. The RP value of 19.304 (95% CI: 4.227-88.152)

suggests that mothers with unsupportive attitudes towards testing are 19.304 times more likely to have low knowledge compared to those with supportive attitudes.

The study by Huy V.N., Lee Y.H., Nam S.Y. (2016) found that the likelihood of having a positive attitude towards HIV/AIDS is 1.72 times higher among women with comprehensive knowledge of HIV/AIDS (OR: 1.72; 95% CI: 1.50-1.96). This may be attributed to the increased proportion of women with comprehensive knowledge, leading to more positive attitudes towards HIV/AIDS. However, the percentage of women with positive attitudes barely exceeded 50%, suggesting that people with HIV in Vietnam face significant stigma. In such a social climate, HIV-positive individuals tend to conceal their status and avoid seeking services like screening tests or treatment, which can contribute to the spread of the disease.

A crosstab analysis of several independent study variables with maternal attitudes towards HIV testing reveals significant relationships with the PPIA program variable (p-value = 0.000; RP = 11.677; 95% CI: 4.000-34.086), counseling (p-value = 0.001; RP = 10.063; 95% CI: 2.213-45.753), and knowledge (p-value = 0.000; RP = 19.304; 95% CI: 4.227-88.152). The absence of the PPIA program results in an 11.677 times greater likelihood of unsupportive attitudes towards testing. Pregnant women who do not undergo pre- and post-test counseling for HIV, Syphilis, and Hepatitis B have a 10.063 times greater likelihood of holding unsupportive attitudes. Mothers with low knowledge are 19.304 times more likely not to support testing.

Transuterine or perinatal transmission of STIs can have devastating consequences for pregnant women, their fetuses, and their partners. All pregnant women and their partners should be questioned about STIs, counseled on the risk of perinatal infection, and provided access to recommended screening and treatment. Screening recommendations for pregnant women are based on factors such as disease severity, population prevalence, cost, medicolegal considerations, and other factors (CDC, 2021).

i. Relationship Between PPIA/PICT and Maternal Knowledge About HIV/AIDS, Syphilis, and Hepatitis B

Table 2. Indicates that among 35 respondents, 25 mothers (71.4%) who reported that PPIA services were unavailable at the Health Center had poor knowledge, while 10 (28.6%) had good knowledge. Among 65 respondents, 26 mothers (40.0%) who reported that PPIA services were available had poor knowledge, while 39 (60.0%) had good knowledge. The Chi-square test for the availability of PPIA services at the Health Center and knowledge variable yielded a p-value of 0.005, which is less than α (0.05), indicating a statistically significant relationship between the availability of PPIA services and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. The RP value of 3.750 (95% CI: 1.547 - 9.090) suggests that mothers who do not access PPIA services at the Health Center are 3.750 times more likely to have low knowledge compared to those who do.

The health care provider's initiative to conduct HIV testing has a p-value of 0.000. Multivariate analysis showed that PITC was the most influential variable in HIV testing behavior among pregnant women, with an exp(B) value of 21.6. This indicates that pregnant women who receive initiation from health care providers are 21.6 times more likely to undergo HIV testing than those who do not receive such initiation (CDC, 2021).

A crosstab analysis of several independent study variables with the PPIA variable identified significant relationships, including the Attitude variable (p-value = 0.000; RP = 11.677; 95% CI: 4.000-34.086) and Knowledge (p-value = 0.005; RP = 3.750; 95% CI: 1.547-9.090). Protective factors include parity (RP = 0.782; 95% CI: 0.319-1.914) and ANC (RP = 0.767; 95% CI: 0.328-1.794), suggesting that low maternal knowledge increases the likelihood of not undergoing PPIA by 3.750 times, and mothers with unsupportive attitudes towards screening are 24.630 times more likely not to undergo PPIA. Parity and ANC act as protective measures for pregnant women.

The study revealed that although most pregnant women had good knowledge and education levels of more than 12 years, this alone did not motivate them to undergo HIV testing. While general knowledge about HIV was good, crucial gaps remained. For instance, 66% of respondents did not know that HIV could be transmitted during childbirth, and 65% were unaware that HIV-positive pregnant women should deliver via cesarean section. Additionally, 90.7% believed that HIV status could be determined solely through pregnancy examinations. According to L. Green's theory, education and knowledge are key predisposing factors for behavior. Ideally, higher education and knowledge should lead to more positive behavior. However, in this study, knowledge was not related to HIV testing behavior, possibly due to the dissemination of inaccurate information.

The study by Hoang V.L., et al. (2019) sought to characterize trends and changes in knowledge about mother-to-child transmission (MTCT) of HIV and identify associated socioeconomic factors among Vietnamese women through a repeated cross-sectional study using data from the Vietnam Multiple Indicator Cluster Surveys (2000, 2006, 2011, and 2014). The study found a slow increase in adequate knowledge about MTCT between 2000 and 2014 (41.81% in 2000, 45.66% in 2006, 49.58% in 2011, and 46.83% in 2014). While most women knew that HIV could be transmitted during pregnancy, more than half were unaware of the three MTCT methods. Socioeconomic factors, including age, ethnicity, education level, and economic status, influenced the knowledge of MTCT.

j. Relationship Between Counseling and Maternal Knowledge About HIV/AIDS, Syphilis, and Hepatitis B

Table 2. Shows that among 63 respondents, 38 mothers (60.3%) who did not agree with counseling had poor knowledge, while 25 (39.7%) had good knowledge. Among 37 respondents, 13 mothers (35.1%) who agreed to counseling had poor knowledge, while 24 (64.9%) had good knowledge. The Chi-square test for the counseling variable and knowledge variable resulted in a p-value of 0.026, which is less than α (0.05), indicating a statistically significant relationship between counseling and pregnant women's knowledge of HIV/AIDS, Syphilis, and Hepatitis B. The RP value of 2.806 (95% CI: 1.208-6.518) suggests that mothers who do not agree with counseling are 2.806 times more likely to have low knowledge compared to those who agree.

A crosstab analysis of several independent study variables with the counseling variable identified significant relationships with the knowledge variable (p-value = 0.026; RP = 2.806; 95% CI: 1.208-6.518) and maternal attitudes towards HIV screening (p-value = 0.001; RP = 10.063; 95% CI: 2.213-45.753). Protective factors include parity (RP = 0.797; 95% CI: 0.336-1.890) and ANC (RP = 0.767; 95% CI: 0.328-1.794), indicating that low maternal knowledge increases the likelihood of not undergoing counseling by 2.806 times, and unsupportive maternal attitudes increase

the likelihood by 10.063 times. Parity serves as a protective measure for pregnant women, suggesting that mothers already understand the risks of having many children. Additionally, knowledge should be further developed during adolescence.

Midwives play a crucial role as health educators and counselors for pregnant women, providing information about risky behaviors for STI transmission and promoting VCT/PMTCT. Their success depends on the support of various stakeholders, including NGOs, as well as access to facilities, information resources, skills, and policies through programs that enhance the capacity of midwives as health educators and counselors for pregnant women in STI prevention efforts (Pipitcahyani I.T, Istiarti VG, Harbandinah P, 2012).

Midwives provide continuous and comprehensive midwifery services, focusing on disease prevention, including HIV & AIDS transmission prevention in pregnant women, and promoting HIV/AIDS awareness by providing health education or counseling during health center visits. Pregnant women are guided to make informed decisions to adopt and maintain new behaviors. Interventions to prevent HIV transmission in pregnant women, including maternal and child health services, serve as the entry point for preventing mother-to-child HIV transmission.

CONCLUSION

Teenage pregnant women in this study exhibited lower knowledge levels compared to adult women, with low family income also contributing to insufficient knowledge. Negative maternal attitudes towards screening were influenced by this lack of knowledge, compounded by poor understanding of PPIA and counseling services at the community health centers. To improve maternal and child health outcomes, several recommendations are made, including the need for enhanced education and empowerment of pregnant women, improved family support, and increased access to health communication channels. Furthermore, revitalizing counseling services with cultural sensitivity and promoting social marketing for KIA and PPIA programs are essential.

References

- 1) Ahmad M. Al Aboud, William Gossman, M. E. T. Tudor ME, Al Aboud AM, Gossman W. Syphilis. [Updated 2022 Jul 23]
- 2) Badan Pusat Statistik Kota Jayapura-BPS Statistics of Jayapura Municipality. Kota Jayapura Dalam Angka Jayapura Municipality-In Figures. Diterbitkan oleh BPS Kota Jayapura. ISBN ; 978-602-5524-47-9. 2021.
- 3) Bjekic M, Sipetić S. Epidemiological and clinical characteristics of syphilis cases. *Health Care* 2014; 43(1):1-5.
- 4) Chaquisse Eusebio, dkk. "Knowledge about HIV, HBV and HCV modes of transmission among pregnant women in Nampula Mozambique". Artikel publish online, <https://doi.org/10.1080/09540121.2018.1466984>. 2018.
- 5) CDC. Sekilas Tentang HIV, Hepatitis Virus, PMS, & TBC Selama Kehamilan. 2021.
- 6) Dinas Kesehatan Provinsi Papua. Laporan Triwulan Ke IV Data HIV-AIDS. 2021.
- 7) Data Sekunder Dinas Kesehatan Propinsi Papua. Laporan Triwulan Ke IV Data HIV-AIDS. 2022.
- 8) Dagnew M, Million Y, Gizachew M, et al. "Hepatitis B & C Viruses infection and Associated Factors among Pregnant Women Attending Antenatal Care in Hospitals in the Amhara National Regional State, Ethiopia". *International Journal of Microbiology*. Doi : 10.1155/2020/8848561. 2020.

- 9) Departement of Health. Hepatitis B. Western Australia : Communicable Disease Control Directorate. 2013;1-4
- 10) Emilia Ova. Promosi Kesehatan Dalam Lingkup Kesehatan Reproduksi. Penerbit Pustaka Cendekia Press. ISBN No. 978-979-1151-16-0. 2008.
- 11) Izadirad H, Zareban Iraj. The Relationship of Health Literacy with health status, preventive Behaviors and Health Services Utilization in Baluchistan, Iran. *Journal of Education and Community Health*. Doi : 10.20286/jech-02036. 2015.
- 12) Kementerian Kesehatan RI. Pedoman Pencegahan Penularan HIV dari Ibu ke Anak. Jakarta. 2021.
- 13) Kemenkes RI. Pusat Data dan Informasi Kementerian Kesehatan RI. Jakarta: Kementerian Kesehatan RI. 2017;1-6
- 14) Kementerian Kesehatan RI. Pedoman Manejemen Program Pencegahan Penularan HIV dan Sifilis dari Ibu ke Anak. Jakarta: Direktorat Jenderal Bina Gizi dan Kesehatan Ibu dan Anak, 2015.
- 15) Notoatmodjo S. Promosi Kesehatan Teori dan Aplikasi. Penerbit Rineka Cipta, Jakarta. 2010.
- 16) Notoatmodjo S. Metodologi Penelitian Kesehatan. Penerbit Rineka Cipta. Jakarta. 2010.
- 17) Nguyen Van Huy, Hwa Young Lee, You Seon Nam, et al. Secular trends in HIV knowledge and attitudes among Vietnamese women based on the Multiple Indicator Cluster Surveys, 2000, 2006, and 2011: what do we know and what should we do to protect them ? *Global Health Action*. 9:1, 29247, ISSN: 1654-9716 (Print) 1654-9880 (Online) Journal homepage: <https://www.tandfonline.com/loi/zgha20>. DOI: 10.3402/gha.v9.29247. 2016.
- 18) Pusat Data dan Informasi Kementerian Kesehatan RI. Situasi Kesehatan Reproduksi Remaja. Jakarta. 2020.
- 19) Permenkes RI No 52. Eliminasi Penularan Human Immunodeficiency virus, Sifilis & Hepatitis B dari Ibu ke Anak. <https://peraturan.bpk.go.id/Home/Details/112155/permenkes-no-52-tahun-2017>. 2017.
- 20) PermenkesRINo75. Puskesmas. <https://peraturan.bpk.go.id/Home/Details/139202/permenkes-no-75-tahun-2014>.
- 21) Perwakilan BKKBN Provinsi Papua. Pencegahan Penularan HIV dari ibu ke anak (PPIA). 2021
- 22) Setiyawati Nanik, Meilani Niken. Determinan Perilaku Tes HIV pada Ibu Hamil (Determinant of HIV Testing Behavior among Pregnant Women). *Jurnal Kesehatan Masyarakat Nasional*, Vol.9 No.3 Februari 2015.
- 23) Pusat Pendidikan & Pelatihan Tenaga Kesehatan. Buku Ajar Kesehatan Ibu dan Anak. 2014.
- 24) Wahyuni T.R dan Puspitasari Nunik. Relationship between Mothers status Too Young, Too Old, Too Close, Too Much (4T), and Contraceptive Use with Incidence of Maternal Mortality. *International Journal of Nursing Education*, April-June 2021, Vol 13 No.2. Doi Number : <https://doi.org/10.37506/ijone.v13i2.14639>. <https://medicopublication.com./indexphp/ijone/article/view/14639>. 2021.
- 25) Worku Gebrie Misganav, Teshale Birhanu Achamyelah, Tesema Antehunegn Getayeneh, et al. Prevalence and Associated Factors of HIV Testing Among Pregnant Women: A Multilevel Analysis Using the Recent Demographic and Health Survey Data from 11 East African Countries. *HIV/AIDS - Research and Palliative Care* 2021;13 181–189) *HIV/AIDS - Research and Palliative Care* downloaded from <https://www.dovepress.com/> by 125.163.189.164 on 25-Aug-2021.
- 26) Zahroh Shaluhiah, Syamsulhuda Budi Musthofa, Bagoes Widjanarko. Public Stigma Masyarakat terhadap Orang dengan HIV/AIDS (Stigma to People Living with HIV/AIDS). *Jurnal Kesehatan - Masyarakat Nasional* Vol.9 No.4 Mei 2015.