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Meta-analysis

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Meta-Analysis the Effects of Education, Pregnancy Planning, Husband Support, and Distance to Health Facilities on the Utilization of Antenatal Care Service

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ABSTRACT

Background: Antenatal care (ANC) is comprehensive and quality antenatal care provided to pregnant women in the form of antenatal checks to prevent causes of morbidity and mortality in pregnant women and children. The decrease in the number of visits of pregnant women to health facilities has resulted in high maternal mortality due to complications of pregnancy and childbirth. This study aimed to analyze the effect of education, pregnancy planning, husband's support, and distance to health facilities on the utilization of ANC.
Subjects and Method: This was a meta-analysis. Population was pregnant women. Intervention: higher education, planned pregnancies, strong husband support, and distance to close facilities. Comparison: low education, unplanned pregnancies, weak spousal support, and long distances to facilities. Outcome: utilization of ANC. The articles used were obtained from Google Scholar, BMC Pregnancy and Childbirth, PubMed, and Science Direct. The keywords used "Antenatal Care" AND "Utilization of ANC" AND "Husband Support and ANC". The articles used were full text in English from 2009 to 2022. Articles were selected using the PRISMA diagram and analyzed using the Review Manager 5.3 application.
Results: 14 cross-sectional studies showed that mothers with higher education (aOR=2.93; 95% CI=1.93 to 4.45; p=0.001); planned pregnancy (aOR= 1.99; 95% CI= 1.26 to 3.15; p=0.003); had husband support (aOR=2.89; 95% CI= 1.23 to 6.81; p=0.020); and closer distance to health facilities (aOR=3.07; 95% CI=1.43 to 6.55; p=0.003) had high and significant posibility to utilize ANC.
Conclusion: Higher education, pregnancy planning, husband's support, and proximity to health facilities influence the utilization of antenatal care.

Keywords: antenatal care, pregnant women, morbidity.

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BACKGROUND

Globally, maternal mortality is a major public health problem. This proves that good ante-

natal care (ANC) services can improve survival and newborns. The World Health Organization (WHO) recommends that mothers make at least eight visits during pregnancy. These visits began with the first visit at 12 weeks of gestation, then at 20, 26, 30, 35, 38, and 40 weeks (Rahimi et al., 2022). Antenatal examination (ANC) is an activity carried out to prevent causes of morbidity and mortality in pregnant women and children. Antenatal examination is a major factor in determining delivery outcomes, including early screening of risk factors and can determine the start of treatment for pregnant women who experience complications during pregnancy (Ministry of Health of the Republic of Indonesia, 2020).

Non-adherence in prenatal check-ups can lead to unknown complications for the mother that can affect pregnancy or pregnancy complications. Maternal death due to complications of pregnancy and childbirth is the majority factor that causes maternal death. This can be prevented by prenatal checks through antenatal services carried out by trained and professional health workers, so that complications can be detected and prevent death for the fetus and pregnant women early and unwanted things do not occur (Lestari, 2021).

Several factors influence the use of antenatal care including education, pregnancy planning, husband's support, and distance to health facilities. The coverage of maternal health indicators is reflected in the indicators of four visits to ANC (K4) and delivery assistance provided by health personnel. Globally, at least pregnant women make one antenatal care visit (ANC). However, only half (52%) of mothers completed the recommended eight visits. In addition, not a few mothers choose to have their pregnancies checked by traditional birth attendants or not have their pregnancies checked at all due to being constrained by the lockdown from the COVID-19 pandemic (Putri and Martya, 2021).

Based on the above background and some similar previous research findings on the influence of education, pregnancy planning, husband support, and distance to health facilities, the researcher is interested in conducting a study using a systematic review and meta-analysis which can summarize some of the results of the primary studies for combine the results and get more precise estimates to draw new conclusions. The purpose of this study was to analyze the influence of education, pregnancy planning, husband's support, and distance to health facilities on the utilization of antenatal care.

SUBJECTS AND METHOD

1. Study Design

This research is a systematic review and meta analysis. The search for article sources carried out by researchers relied on online article searches. Data collection was obtained from four databases, namely Google Scholar, BMC Pregnancy and Childbirth, PubMed, and Science Direct. The keywords used to search for articles are “Antenatal Care” AND “Utilization of ANC” AND “Husband Support and ANC”. The analysis of this research uses the Review Manager 5.3 application.

2. Steps of Meta-Analysis

Meta-analysis analysis was carried out through 5 steps as follows:

1) Formulate research questions in PICO (Population, Intervention, Comparison, Outcome). The PICO formula in this study is Population = pregnant women. Intervention= higher education, planned pregnancies, strong husband support, and distance to close health facilities. Comparison = low education, unplanned pregnancies, weak husband support, and long distance to health facilities. Outcome = utilization of antenatal services.
2) Search for articles from various databases

including Google Scholar, BMC Pregnancy and Childbirth, PubMed, and Science Direct.

3) Screening and conducting critical appraisal of primary studies using the Critical Appraisal Checklist for Cross-sectional Studies from the Center for Evidence Management.
4) Perform data extraction and enter the effect size of each primary study into the RevMan 5.3 application.
5) Interpret the results of the analysis on the research and draw the latest conclusions.

3. Inclusion Criteria

The inclusion criteria used were articles in full text and published in English, using a cross-sectional study design, the results of the study were tested multivariately and reported in the adjusted odds ratio (aOR), and the outcome of the study was the use of antenatal care.

4. Exclusion Criteria

Exclusion criteria in this study were articles published before 2009 and articles published other than English.

5. Operational Definition

Education is an attempt to develop personality and abilities, both formally and non-formally and lasts a lifetime. The instrument used is a questionnaire. The categories used are higher education and lower education. The measurement scale used is categorical.

Pregnancy planning is the activity of planning a pregnancy by delaying or deciding to conceive, either by carrying out preconception screening or by using appropriate contraception. The instrument used is a questionnaire. The categories used are pregnancy planning and no pregnancy planning. The measurement scale used is categorical.

Husband's support is the motivation and encouragement given by the husband in the form of attention, affection, and assistance to his wife. The instrument used is a questionnaire. The categories used are husband support and no husband support. The measurement scale used is categorical.

Mileage is the location of an area related to the affordability of place and time and can be measured from the distance of time and travel costs. The instrument used is a questionnaire. The categories used are the short distance to the health facility and the long distance to the health facility. The measurement scale used is categorical**.**

6. Instrument

The study instrument used in this study was the Critical Appraisal Checklist for Cross-sectional Study from the Magister of Public Health, Postgraduate School, Sebelas Maret University).

7. Data Analysis

The collected research articles were then analyzed using the Review Manager 5.3 application. Data processing is done by calculating the aOR. Forest plots and funnel plots were used to determine effect sizes and data heterogeneity.

RESULT

Search for articles in this study through databases that include Google Scholar, BMC Pregnancy and Childbirth, PubMed, and Science Direct. The keywords used include “Antenatal Care” AND “Utilization of ANC” AND “Husband Support and ANC”. The article review process can be seen in the search flow in the PRISMA flow diagram in Figure 1. The initial search process yielded 2,060 articles, after the process of removing duplicate articles, 1,623 were obtained and 437 articles met the requirements for a full text review. The final results obtained were 14 articles that met the criteria according to the quantitative synthesis meta-analysis.

Figure 2 shows the distribution map of research on the influence of education, pregnancy planning, husband's support, and distance to health facilities on the utilization

of antenatal services obtained. A total of 14 articles were obtained from 2 continents, namely 8 studies were obtained from the African continent, namely 7 from Ethiopia and 1 from Mozambique, and 6 studies were obtained from the Asian continent, namely Afghanistan, the Philippines, Indonesia, Myanmar, Nepal and Vietnam.

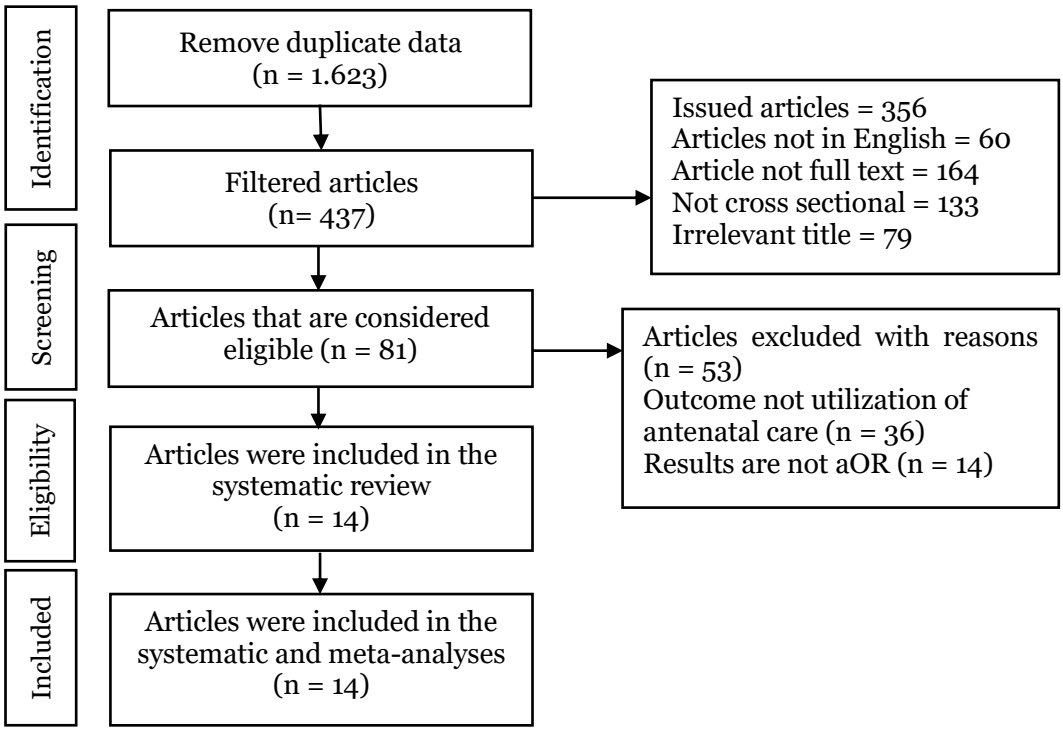

Figure 1. PRISMA flow diagram

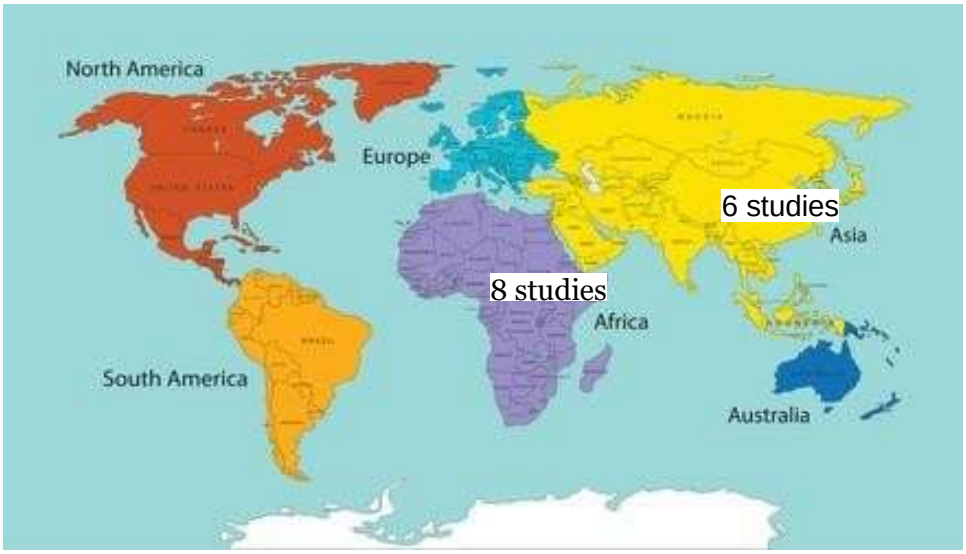

Figure 2. Map of the distribution area of research on the influence of education, pregnancy planning, husband's support, and distance to health facilities on the utilization of antenatal care

Table 1. Critical appraisal checklist for cross-sectional study from the center for evidence-based management

Author (Year)	Criteria of Questions							Total
	1	2	3	4	5	6	7	
Tewodros et al. (2009)	2	2	2	2	2	2	2	14
Abosse et al. (2010)	2	2	2	2	2	2	2	14
Tizazu et al. (2020)	2	2	2	2	2	2	2	14
Gebrekirstos et al. (2021)	2	2	2	2	2	2	2	14
Bala et al. (2017)	2	2	2	2	2	2	2	14
Wolderufael (2018)	2	2	2	2	2	2	2	14
Tsegaye et al. (2021)	2	2	2	2	2	2	2	14
Reis-Muleva et al. (2021)	2	2	2	2	2	2	2	14
Dewi et al. (2014)	2	2	2	2	2	2	2	14
Wai et al. (2015)	2	2	2	2	2	2	2	14
Kaphle et al. (2018)	2	2	2	2	2	2	2	14
Ha et al. (2015)	2	2	2	2	2	2	2	14
Rahimi et al. (2022)	2	2	2	2	2	2	2	14
De Guzman et al. (2022)	2	2	2	2	2	2	2	14

Description of the question criteria:

1) Formulation of research questions in the acronym PICO:

a. Was the population in the primary study the same as the population in the PICO meta-analysis?

b. Is the operational definition of exposure/ intervention in the primary study the same as the definition intended in the meta-analysis?

c. Was the comparison used in the primary study the same as that planned for the meta-analysis?

d. Were the outcome variables studied in the primary study the same as those planned in the meta-analysis?

2) Methods for selecting research subjects:

a. Descriptive cross-sectional (prevalence) study: Was the sample randomly selected?

b. Analytic cross-sectional study: Was the sample chosen randomly or purposively?

3) Methods for measuring comparisons (intervention) and outcome variables:

a. Were exposure/ intervention and outcome variables measured by the same instrument (measuring instrument) in all primary studies?

b. If variables are measured on a categorical scale, are the cutoffs or categories used the same across primary studies?

4) Design related bias:

a. What is the Response Rate?

b. Is non-response related to outcome?

5) Methods to control cofounding:

a. Was there any confusion in the results/ conclusions of the primary study?

b. Did the primary study investigator use appropriate methods to control for the effects of ambiguity?

6) Methods of statistical analysis:

a. In a cross-sectional study, was a multivariate analysis performed? Multivariate analysis includes multiple linear regression analysis, multiple logistic regression analysis, Cox regression analysis.

b. Does the primary study report effect sizes or relationships on multivariate analysis?

7) Conflict of Interest:

a. Is there a conflict of interest with the research sponsor?

Assessment Guide:

1) The total answer score for each question is "2".

2) If the answer to one question is "Yes", then

give a score of "2" to that question.
3) If in one question there is one item whose answer is "No", then give a score of "1" to that question.
4) If on one question all the items the answer is "No", then give a score of "0" to that question.
5) If the total score = 14, then the primary study can be used in the meta-analysis.
6) If the total score is <14, then the primary study cannot be used in the meta-analysis.

Table 2. PICO table for primary studies on the effect of education on the utilization of antenatal care (n = 14.159)

Author (Year)	Country	Sample	P	I	C	O
Tizazu et al. (2020)	Ethiopia	393	Mother has given birth in the last 6 months	Higher education	Low education	Utilization of antenatal services
Gebrekirstos et al. (2021)	Ethiopia	670	Mother has given birth in the last 1-2 years	Higher education	Low education	Utilization of antenatal services
De Guzman et al. (2022)	Filipina	318	Postpartum women	Higher education	Low education	Utilization of antenatal services
Tewodros et al. (2009)	Ethiopia	651	Mother has given birth in the last 12 months	Higher education	Low education	Utilization of antenatal services
Ha et al. (2015)	Vietnam	907	Mother has given birth in the last 12 months	Higher education	Low education	Utilization of antenatal services
Reis-Muleva et al. (2021)	Mozambique	381	Postpartum women	Higher education	Low education	Utilization of antenatal services
Bala et al. (2017)	Ethiopia	422	Mother has given birth in the last 2 years	Higher education	Low education	Utilization of antenatal services
Kaphle et al. (2018)	Nepal	1302	Mother has given birth in the last 2 years	Higher education	Low education	Utilization of antenatal services
Rahimi et al. (2022)	Afghanistan	1524	Mother has given birth in the last 12 months	Higher education	Low education	Utilization of antenatal services
Tsegaye et al. (2021)	Ethiopia	7591	Mother has given birth at least once in the last 5 years	Higher education	Low education	Utilization of antenatal services

Table 2 presents a summary of the source articles obtained from 10 primary articles with a cross-sectional study design used for the meta-analysis of the effect of education on the utilization of antenatal care. The total sample is 14,159 spreads across Afghanistan, Ethiopia, the Philippines, Mozambique, Nepal and Vietnam.

a. Forest Plot

Forest plot Figure 3 shows that mothers with higher education are 2.93 times more likely to avail antenatal care than mothers with lower education (aOR = 2.93; 95% CI = 1.93 to 4.45; p = 0.001). Heterogeneity in the studies showed (I2 = 57%; p = 0.010). Thus, the calculation of the average effect estimate

is carried out using the random effect model approach.

Table 3. Value of adjusted odds ratio (aOR) and 95% confidence interval (CI 95%) effect of education on service utilization

Name (Year)	aOR	Lower Limit	Upper Limit
Tizazu et al. (2020)	3.79	1.54	9.33
Gebrekirstos et al. (2021)	4.15	1.95	8.83
De Guzman et al. (2022)	3.05	0.81	11.48
Tewodros et al. (2009)	3.90	1.66	9.16
Ha et al. (2015)	1.70	1.16	2.49
Reis-Muleva et al. (2021)	11.78	2.91	47.69
Bala et al. (2017)	3.38	1.86	6.14
Kaphle et al. (2018)	2.41	1.34	4.31
Rahimi et al. (2022)	0.10	0.01	1.00
Tsegaye et al. (2021)	4.70	0.30	73.64

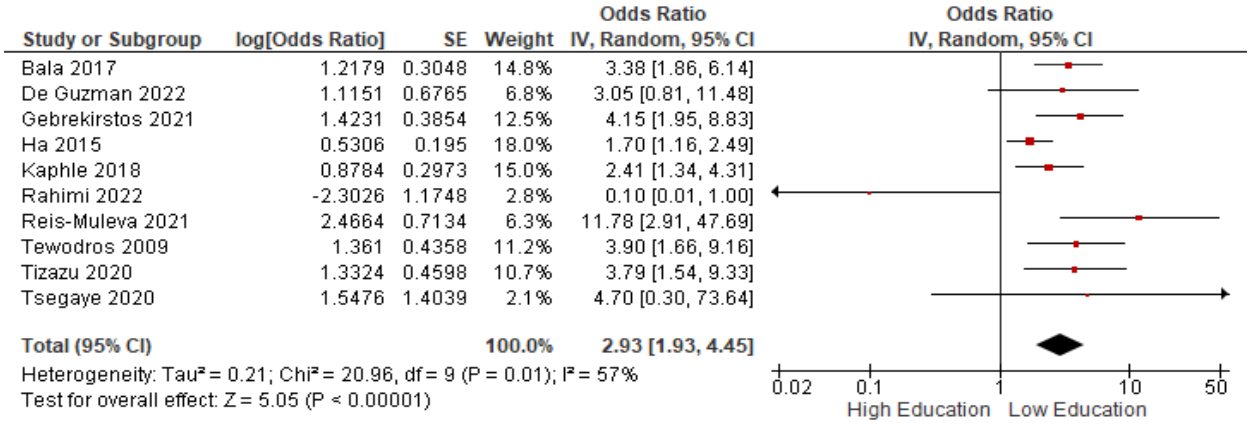

Figure 3. Forest plot of educational influence on the use of antenatal care

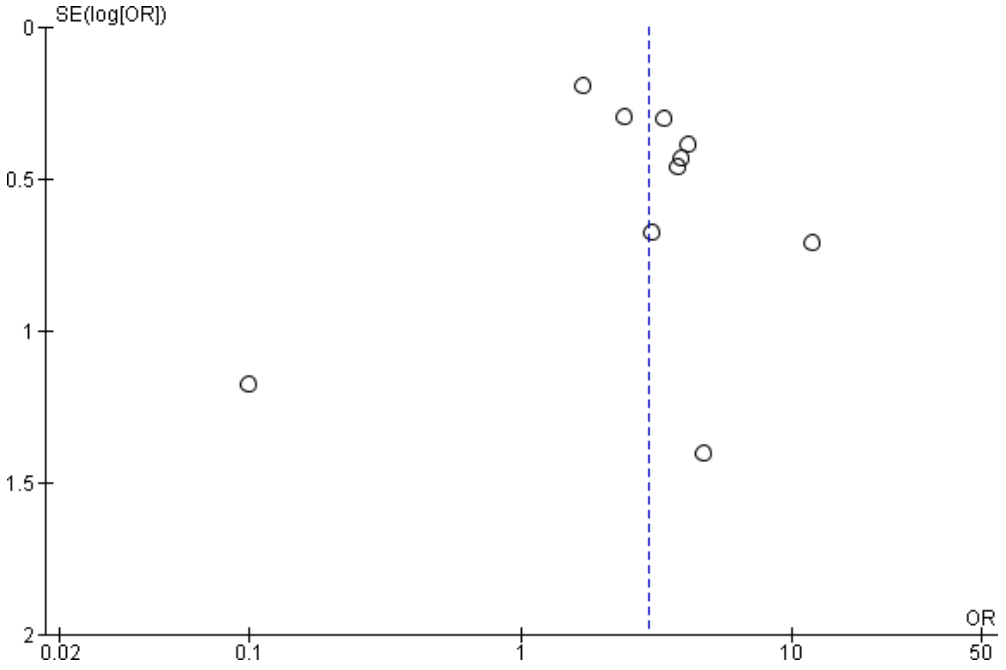

Figure 4. Funnel plot of the influence of education on use of antenatal care

b. Funnel Plot

The funnel plot in Figure 4 shows the distribution of effect estimates to the right is larger than to the left of the estimated average vertical line, indicating publication bias. The distribution of effects in the funnel plot is located to the right of the same vertical line as the location of the diamonds in the forest plot which is also on the right, so that publication bias tends to overestimate the actual effect.

Table 4. PICO table for primary studies on the effect of pregnancy planning on the utilization of antenatal care (n = 4.329)

Author (Year)	Country	Sample	P	I	C	O
Rahimi et al. (2022)	Afghanistan	1524	Mother has given birth in the last 12 months	There is planning a pregnancy	No pregnancy planning	Utilization of antenatal services
Tewodros et al. (2009)	Ethiopia	651	Mother has given birth in the last 12 months	There is planning a pregnancy	No pregnancy planning	Utilization of antenatal services
Tizazu et al. (2020)	Ethiopia	393	Mother has given birth in the last 6 months	There is planning a pregnancy	No pregnancy planning	Utilization of antenatal services
Abosse et al. (2010)	Ethiopia	710	Mother has given birth at least once in the last 5 years	There is planning a pregnancy	No pregnancy planning	Utilization of antenatal services
Reis-Muleva et al. (2021)	Mozambik	381	Postpartum women	There is planning a pregnancy	No pregnancy planning	Utilization of antenatal services
Gebrekirstos et al. (2021)	Ethiopia	670	Mother has given birth in the last 1-2 years	There is planning a pregnancy	No pregnancy planning	Utilization of antenatal services

Table 5. Value of adjusted odds ratio (aOR) and 95% confidence interval (95% CI) effect of pregnancy planning on service utilization

Name (Year)	aOR	Lower Limit	Upper Limit
Rahimi et al. (2022)	1.80	0.60	5.40
Tewodros et al. (2009)	4.14	2.18	7.86
Tizazu et al. (2020)	2.08	0.44	9.83
Abosse et al. (2010)	1.76	1.10	2.82
Reis-Muleva et al. (2021)	0.97	0.56	1.68
Gebrekirstos et al. (2021)	2.60	1.35	5.01

Table 4 presents a summary of the source articles that obtained as many as 6 primary articles with a cross-sectional study design used for the meta-analysis of the effect of pregnancy planning on the utilization of antenatal care. The total sample is 4,329 spread across Afghanistan, Ethiopia and Mozambique.

a. Forest Plot

Forest plot Figure 5 shows that women who are planning a pregnancy are 1.99 times more likely to avail antenatal care than women who are not planning a pregnancy (aOR = 1.99; 95% CI = 1.26 to 3.15; p = 0.003). Heterogeneity in the studies showed (I2 = 60%; p = 0.030). Thus, the calculation

of effect estimation is carried out using the random effect model approach.

b. Funnel Plot

The funnel plot of Figure 6 shows that the distribution of effect estimates is more on the left than on the right and some are attached to the vertical line, thus indicating a slight publication bias. The estimated effect on the funnel plot is more on the left, while the location of the diamonds in the forest plot is on the right of the vertical line, so the publication bias tends to underestimate the actual effect.

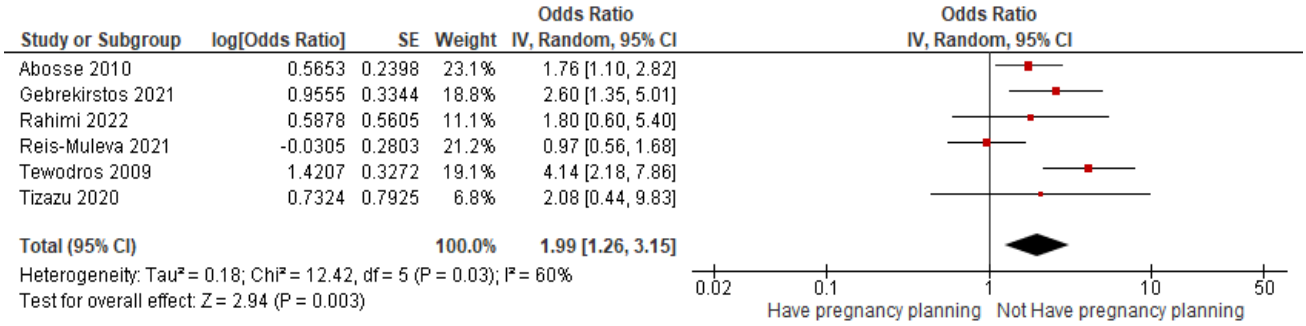

Figure 5. Forest plot of influence of pregnancy planning on the use of antenatal care

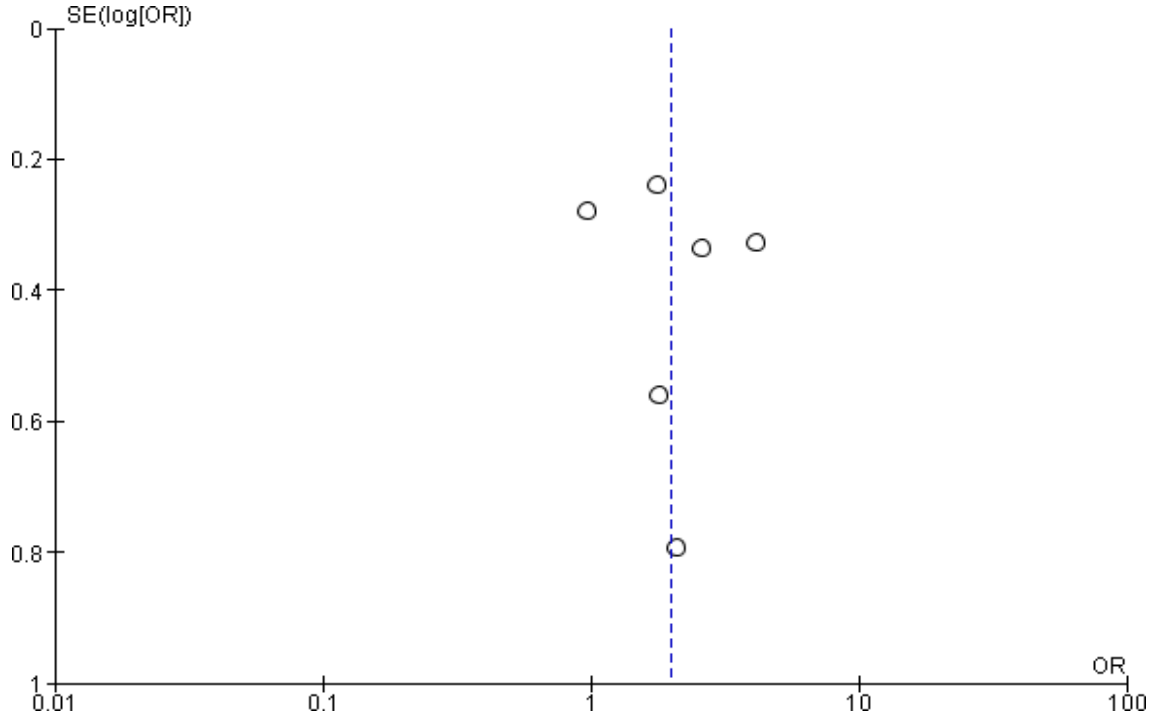

Figure 6. Funnel plot of the influence pregnancy planning on the use of antenatal care

Table 6. PICO table for primary studies on the effect of husband's support on the utilization of antenatal care (2,465)

Author (Year)	Country	Sample	P	I	C	O
Tizazu et al. (2020)	Ethiopia	393	Mother has given birth in the last 6 months	There is husband support	There is husband support	Utilization of antenatal services
Ha et al. (2015)	Vietnam	907	Mother has given birth in the last 12 months	There is husband support	There is husband support	Utilization of antenatal services
Gebrekirstos et al. (2021)	Ethiopia	670	Mother has given birth in the last 1-2 years	There is husband support	There is husband support	Utilization of antenatal services
Dewi et al. (2014)	Indonesia	69	3rd trimester pregnant women	There is husband support	There is husband support	Utilization of antenatal services
Wai et al. (2015)	Myanmar	426	Mother has given birth in the last 2 years	There is husband support	There is husband support	Utilization of antenatal services

Table 7. Value of adjusted odds ratio (aOR) and 95% confidence interval (CI 95%) effect of husband's support on the utilization of antenatal care

Author (Year)	aOR	Lower Limit	Upper Limit
Tizazu et al. (2020)	2.29	1.08	4.87
Ha et al. (2015)	1.01	0.65	1.57
Gebrekirstos et al. (2021)	3.84	1.05	14.04
Dewi et al. (2014)	5.25	1.35	20.41
Wai et al. (2015)	5.82	3.34	10.14

Table 6 presents a summary of the source articles obtained by 5 primary articles with a cross-sectional study design used for meta-analysis on the effect of spousal support on the utilization of antenatal care. The total sample is 2,465 spread across the countries of Ethiopia, Indonesia, Myanmar and Vietnam.

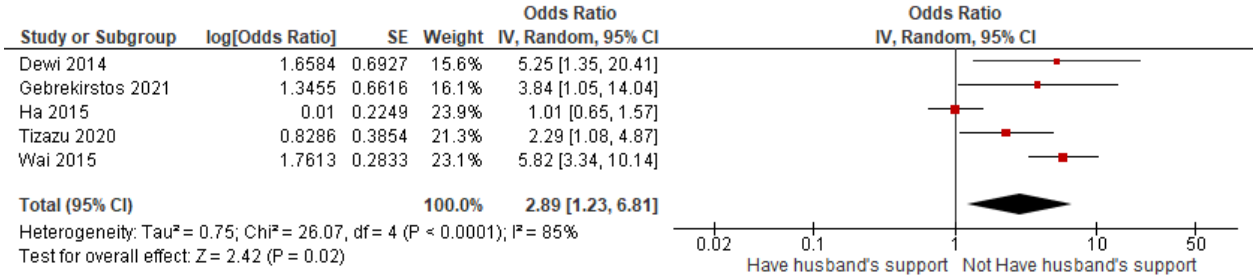

Figure 7. Forest plot influence of husband's support on the use of Antenatal Care

a. Forest Plot

Forest plot Figure 7 shows that mothers who receive spousal support are 1.99 times more likely to avail antenatal care than mothers who do not receive spousal support (aOR = 2.89; 95% CI = 1.23 to 6.81; p = 0.020).

Heterogeneity in the studies showed (I^2 = 85%; p = 0.020). Thus, the calculation of effect estimation is carried out using the random effect model approach.

b. Funnel Plot

The funnel plot of Figure 8 shows the distribution of effect estimates to the right is larger than to the left of the average vertical line of estimates, thus indicating publication bias. The distribution of effects in the funnel plot is located to the right of the same vertical line as the location of the diamonds in the forest plot which is also on the right, so that publication bias tends to overestimate the actual effect.

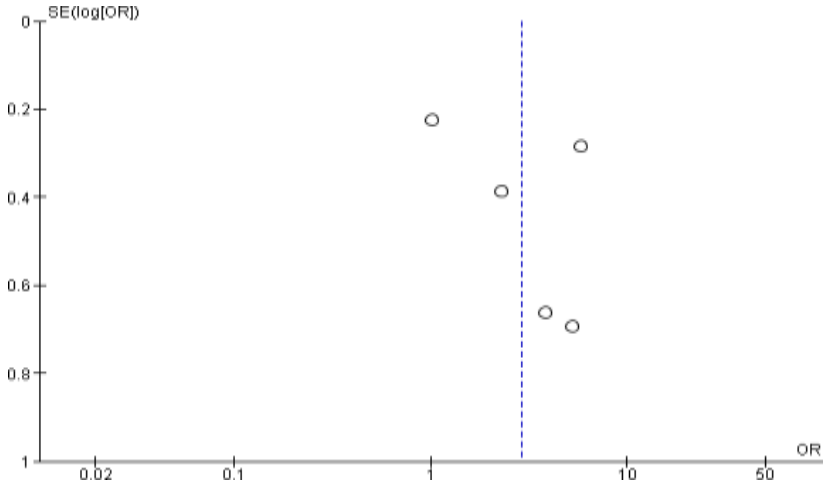

Figure 8. Funnel plot of the influence of husband's support on the use of Antenatal Care

Table 8. Table PICO of the primary study of the effect of distance to health facilities on the utilization of antenatal care (n = 3.632)

Author (Year)	Country	Sample	P	I	C	O
Abosse et al. (2010)	Ethiopia	710	Mother has given birth at least once in the last 5 years	Distance to close health facilities	Distance to health facilities is far	Utilization of antenatal services
Kaphle et al. (2018)	Nepal	1302	Mother has given birth in the last 2 years	Distance to close health facilities	Distance to health facilities is far	Utilization of antenatal services
Tewodros et al. (2009)	Ethiopia	651	Mother has given birth in the last 12 months	Distance to close health facilities	Distance to health facilities is far	Utilization of antenatal services
Wolderufael (2018)	Ethiopia	651	Mother has given birth at least once in the last 5 years	Distance to close health facilities	Distance to health facilities is far	Utilization of antenatal services
De Guzman et al. (2022)	Filipina	318	Postpartum women	Distance to close health facilities	Distance to health facilities is far	Utilization of antenatal services

Table 9. Value of adjusted odds ratio (aOR) and 95% confidence interval (CI 95%) effect of distance to health facilities on utilization of antenatal services

Author (Year)	aOR	Lower Limit	Upper Limit
Abosse et al. (2010)	3.86	2.08	7.16
Kaphle et al. (2018)	1.64	1.03	2.59
Tewodros et al. (2009)	8.80	4.85	15.97
De Guzman et al. (2022)	1.27	0.59	2.71
Wolderufael (2018)	4.21	1.02	17.32

Table 8 presents a summary of the source articles obtained by 5 primary articles with a cross-sectional study design used for meta-analysis on the effect of distance to health facilities on the utilization of antenatal care. The total sample is 3,632 spread across the countries of Ethiopia, the Philippines and Nepal.

a. Forest Plot

Forest plot Figure 9 shows that mothers who are closer to health facilities are 3.07 times more likely to avail antenatal services than mothers who are further away from health facilities (aOR = 3.07; 95% CI = 1.43 to 6.55; p = 0.003). Heterogeneity in the studies showed (I^2 = 84%; p = 0.004). Thus, the calculation of effect estimation is carried out using the random effect model approach.

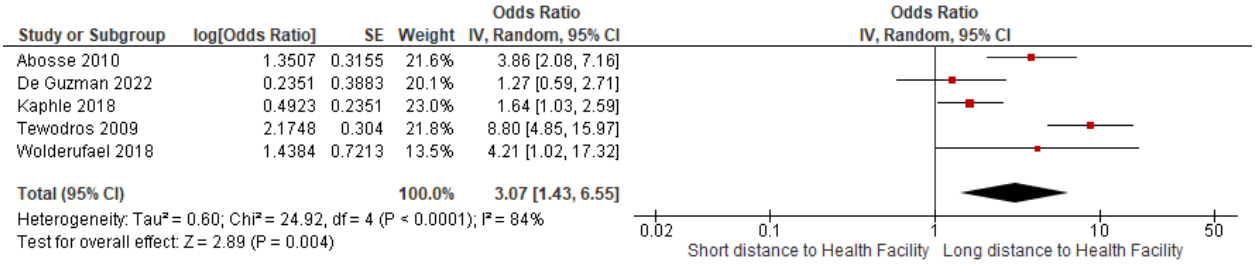

Figure 9. Forest plot the influence of the distance to the health facility on the use of Antenatal Care

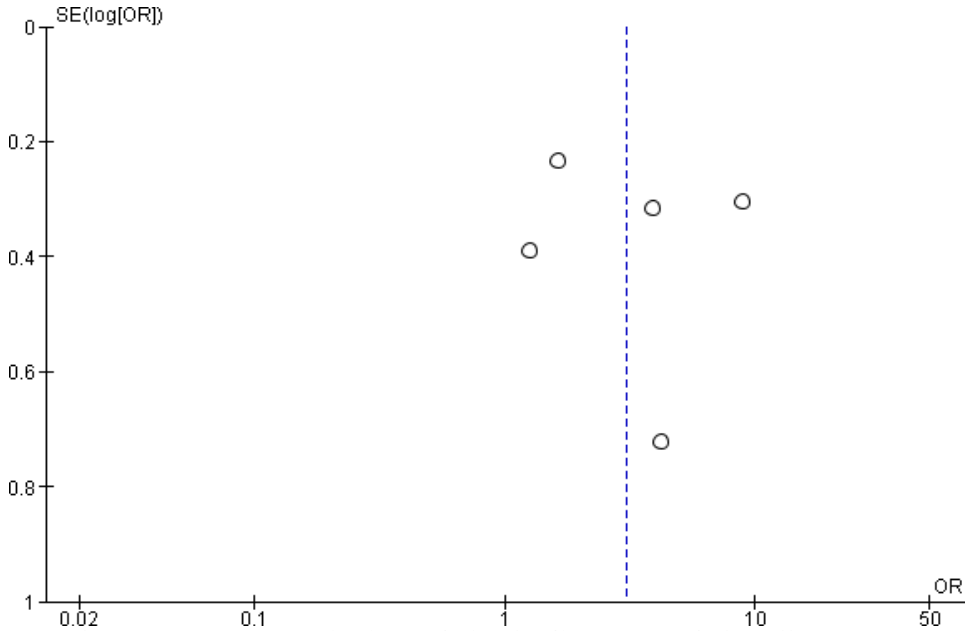

Figure 10. Funnel plot of the influence of the distance to the health facility on the use of Antenatal Care

b. Funnel Plot

The funnel plot of Figure 10 shows the distribution of effect estimates to the right is larger than to the left of the estimated average vertical line, thus indicating publication bias. The distribution of effects in the funnel plot is located to the right of the same vertical line as the location of the diamonds in the forest plot which is also on the right, so that publication bias tends to overestimate the actual effect.

DISCUSSION

In a study with a systematic review design and meta-analysis with the topic of the influence of education, pregnancy planning, husband's support, and distance to health facilities on the utilization of antenatal care. This study discusses the factors that influence the use of antenatal care.

Based on an analysis of 10 primary studies, it was found that mothers with higher education were 2.93 times more likely to take advantage of antenatal care than mothers with low education (aOR = 2.93; 95% CI = 1.93 to 4.45; p = 0.001). This is in line with Reis-Muleva et al. (2021) which revealed that mothers with higher education were 2.91 times more likely to utilize antenatal services compared to mothers with low education.

A better level of education has an influence on the knowledge and confidence of mothers in fulfilling health through the utilization of pregnancy services. Research by Kaphle et al., (2018) shows that as many as 87% of highly educated mothers use ANC. Educated mothers who can access and obtain information about their pregnancies have a better understanding of the benefits of ANC and are confident in making decisions (De Guzman et al, 2022). A similar study was conducted based on a health survey in Ethiopia that showed that >50% of highly educated mothers took advantage of ANC (Tsegaye et al., 2021). This shows that the education level of pregnant women is one of the factors associated with increased knowledge, thereby encouraging behavior in utilizing antenatal care for pregnant women.

Based on the analysis of 6 primary studies, it was found that women who are planning a pregnancy are 1.99 times more likely to take advantage of antenatal care than mothers who are not planning a pregnancy (aOR = 1.99; 95% CI = 1.26 to 3.15; p = 0.003). Pregnancy planning is influenced by how much the couple wants to make efforts to get offspring through the pregnancy process. Efforts to plan a pregnancy are made so that the 4Ts do not occur, namely Too Young, Too Old, Too Often, and Too Many. Based on research in Mozambique, 47.5% of those who used antenatal care did not plan a pregnancy, while 55.9% did not plan a pregnancy (Reis-Muleva et al., 2021).

According to research in Afghanistan, only 24.5% of mothers carry out pregnancy planning and utilize antenatal services (Rahimi et al., 2022). A study conducted in the City of Debre Berhan reported different findings, which stated that mothers carrying out pregnancy planning were 2.08 times more likely to utilize antenatal services with a total of 77.1% of mothers (Tizazu et al., 2020). The big difference between the number of mothers who are planning a pregnancy and those who are not planning a pregnancy is a situation that must be immediately considered, both by each couple and the efforts of the government and health workers. A similar study was conducted in America which stated that unwanted pregnancies and births could become a global social and health burden. Therefore, physical and mental preparations are needed to prepare the mother's body for changes during pregnancy, reduce stress, and reduce the risk of complications during pregnancy. In addition, a good pregnancy process also has a positive impact on the condition of the fetus and the

psychological condition of the couple.

Based on the analysis of 5 primary studies, it was found that mothers who received spousal support were 1.99 times more likely to utilize antenatal care than mothers who did not receive spousal support (aOR= 2.89; 95% CI= 1.23 to 6.81; p= 0.020). A study in Vietnam explains that mothers who get husband support utilize antenatal services 1.01 times compared to mothers who do not get husband support (Ha et al., 2015).

Support from the husband is important in realizing positive things for the growth and development of the fetus, the physical and psychological health of the mother. The support given by the husband while the wife is pregnant can help the wife reduce anxiety and restore the confidence of the expectant mother in experiencing her pregnancy process. Research conducted in the City of Debre Berhan stated that almost 90% of mothers received husband's support during health care visits and that mothers who received husband's support utilized antenatal services 2.29 times compared to mothers who did not receive husband's support (Tizazu et al., 2020). Based on research in Indonesia, mothers who received husband's support used antenatal care 5.25 times compared to mothers who did not receive husband's support with p = 0.017 (Dewi et al., 2014). Research conducted in Myanmar reported that the utilization rate of ANC in Yangon reached 75.8%. Husband's assistance is considered as a form of direct involvement and the mother will have better birth outcomes when the husband accompanies the mother for antenatal visits (Wai et al., 2015).

Based on the analysis of 5 primary studies, it was found that mothers who were closer to health facilities were 3.07 times more likely to avail antenatal services than mothers who were further away from health facilities (aOR = 3.07; 95% CI = 1.43 to 6.55; p= 0.003). This is in line with previous research conducted in the Menit-Shasha District which explained that mothers who are close to health facilities use health services 4.21 times compared to mothers who are far from health facilities with a total of 96% of mothers (Wolderufael, 2018).

The relationship between the location of the health facility and the location of pregnant women with the measurement indicators in the form of distance travelled, travel time and costs required to reach the location. The less the distance, the higher the access to the utilization of health facility services. According to a study in Yem Special Woreda, >50% of mothers receive antenatal care services at health posts that are easy to reach. Studies report that the distance or time required to reach the nearest health unit is an important barrier to the utilization of antenatal services (Tewodros et al., 2009). Study in Nepal shows that mothers who are <30 minutes away from a health facility use ANC 1.63 times compared to mothers who are >30 minutes away from a health facility (Kaphle et al., 2018). This condition indicates that the easier access that is passed by pregnant women to health facilities, the greater the utilization of health services.

Several other studies have also stated that education, pregnancy planning, husband's support, and distance to health facilities affect the use of ANC. The limitations of this study are the presence of language bias because it only uses articles that use English, publication bias is shown in the funnel plot results for each variable, and search bias because it only uses four databases. The conclusion in this meta-analysis study is that mothers with higher education are 2.93 times more likely to take advantage of antenatal care than mothers with low education (aOR = 2.93; 95% CI= 1.93 to 4.45; p= 0.001), mothers who are planning a pregnancy are more likely to utilizing antenatal services 1.99 times compared to mothers who did not plan

a pregnancy (aOR= 1.99; 95% CI= 1.26 to 3.15; p= 0.003), mothers who received support from their husbands had the possibility to utilize antenatal services 1.99 times compared to mothers who did not receive support from their husbands. (aOR = 2.89; 95% CI = 1.23 to 6.81; p = 0.020), and mothers who are closer to health facilities have 3.07 times more likely to avail antenatal services than mothers who are farther to health facilities (aOR= 3.07; 95% CI= 1.43 to 6.55; p= 0.003).

The results of this meta-analysis research can be used by policy makers so they can contribute to increasing interest and motivation and awareness regarding the importance of each individual and family in utilizing antenatal services by maximizing the functions of existing health facilities and through strengthening policies regarding regulations related to antenatal care.

AUTHORS CONTRIBUTION

Fransiska Sitepu as a researcher who selected topics, searched for and collected research data. Didik Tamtomo and Hanung Prasetya analyzed the data and reviewed research documents.

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CONFLICT OF INTEREST

There was no conflict of interest in this study.

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REFERENCES

Bala ET, Ifa M (2017). Determinants of Antenatal Care Utilization in Ambo Town, Central Ethiopia: Community Based Cross Sectional Study. 36 (January 2017), 1–8.

De Guzman GS, Banal-Silao MJB (2022). Antenatal Care Utilization during The COVID-19 Pandemic: An Online Cross-Sectional Survey among Filipino Women. BMC Pregnancy Childbirth, 22(1): 1–12. DOI: 10.1186/s12884-022-05234-5.

Dewi MK, Widarini W, Karmaya INM (2014). Hubungan karakteristik sosial ekonomi dan dukungan suami dengan kelengkapan antenatal care (ANC) di Puskesmas Denpasar Selatan III (The relationship between socio-economic characteristics and husband's support with the completeness of antenatal care (ANC) at the South Denpasar Health Center III). PHPMA. 2(1): 45. DOI: 10.15562/phpma.v2i1.122

Gebrekirstos LG, Wube TB, Gebremedhin MH, Lake EA. (2021). Magnitude and determinants of adequate antenatal care service utilization among mothers in Southern Ethiopia. PLoS ONE. 16 (7), 1–19. DOI: 10.1371/journal.pone-.0251477

BTT, Tac PV, Duc DM, Duong DTT, Thi LM. (2015). Factors associated with four or more antenatal care services among pregnant women: a cross-sectional survey in Eight South Central Coast Provinces of Vietnam. Int J Womens Health. 7, 699–706. DOI: 10.2147/IJ-WH.S87276

Kaphle HP, Gupta N, Shrestha N, Paul A, Dayal A, Singh A (2018). Determinants for the Utilization of Antenatal Care in Nepal. IJPSM 8(5): 7–18. DOI: 10.24-247/ijmpsoct20182

Kementerian Kesehatan Republik Indonesia (2020a). Pedoman pelayanan antenatal, persalinan, nifas, dan bayi baru lahir di era adaptasi baru (Guidelines for antenatal care, delivery, post-partum, and newborns in the new

adaption era).

Lestari RR (2021). Gambaran pengetahuan ibu hamil dan dukungan suami terhadap kunjungan antenatal care (ANC) Di Desa Salo Timur Wilayah Kerja Puskesmas Salo Tahun 2020 (Overview of knowledge of pregnant women and husband's support for antenatal care (ANC) visits in East Salo Village Work Area of Salo Health Center in 2020). PREPOTIF, 5(1), 181–187. DOI: 10.-31004/prepotif.v5i1.1372

Putri SW, Martya R (2021). Pelayanan antenatal care (ANC) pada ibu hamil di fasilitas pelayanan kesehatan selama pandemi COVID-19 (Antenatal Care Services (ANC) for pregnant women in health service facilities during the COVID-19 pandemic). NERSMID. 4(1): 1–11

Rahimi BA, Mohamadi E, Maku M, Hemat MD, Farooqi K, Mahboobi BA, Mudaser GM, Taylor WR (2022). Challenges in antenatal care utilization in Kandahar, Afghanistan: a cross-sectional analytical study. PloS One. 17(11): e0277075. DOI: 10.1371/journal.pone.-0277075

Reis-Muleva B, Duarte LS, Silva CM, Gouveia LMR, Borges ALV (2021). Antenatal Care in Mozambique: Number of Visits and Gestational Age at the Beginning of Antenatal Care. Rev Lat Am Enfermagem, 29 (October). DOI: 10.1590-/1518-8345.4964.3481

Tewodros B, Mariam GA, Dibaba Y (2012). Factors affecting antenatal care utilization in Yem Special Woreda, Southwestern Ethiopia. Ethiop J Health Sci. 9(1): 25–27

Tizazu MA, Asefa EY, Muluneh MA, Haile AB (2020). Utilizing a minimum of four antenatal care visits and associated factors in Debre Berhan Town, North Shewa, Amhara, Ethiopia, 2020. Risk Manag. Healthc. Policy. 13: 2783–2791. DOI: 10.2147/RMHP.S285875

Tsegaye B, Amare B, Reda M (2021). Prevalence and factors associated with immediate postnatal care utilization in Ethiopia: Analysis of Ethiopian Demographic Health Survey 2016. IJWH, 13, 257–266. DOI: 10.2147/IJWH.S294-058.

Wai KM, Shibanuma A, Oo NN, Fillman TJ, Saw YM, Jimba M (2015). Are husbands involving in their spouses' utilization of maternal care services?: a cross-sectional study in Yangon, Myanmar. PLoS ONE, 10(12). DOI: 10.1371-/journal.pone.0144135.

Wolderufael TS (2018). Factors influencing antenatal care service utilization among pregnant women in pastoralist community in Menit-Shasha District, Ethiopia. International Journal of Medical Research & Health Sciences, 7(5): 143– 156. www.ijmrhs.com