

## SYSTEMATIC REVIEW

## Analysis of factors that affect the utilization of antenatal care in developing countries: A systematic review

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### Abstract

**Objective:** To explain the factors related to the implementation of antenatal care in developing countries.

**Methods:** The systematic review was conducted in June 2020 and comprised literature search on Scopus, Cumulated Index to Nursing and Allied Health Literature, PubMed and Garba Rujukan Digital databases for cross-sectional, survey-based, prospective, mixed-method, correlational, experimental, longitudinal, cohort and case-control studies published after 2015 in either English or Indonesian. The studies included involved pregnant women and discussed the factors of implementing antenatal care in developing countries, and explained the factors related to the implementation of antenatal care in accordance with the World Health Organisation recommendation. The Population, Intervention, Comparison, Outcomes and Study framework was used, and the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines were followed. Data was analysed using descriptive statistics with a narrative approach.

**Results:** Of the 9,733 studies initially found, 50(0.005%) were shortlisted for full-text review, and, of them, 15(30%) were reviewed and analysed. There were 3(20%) each from Pakistan and Ghana, 2(13.3%) each from Nepal and India, and 1(6.66%) each from Jordan, Egypt, Yemen, South Africa and Vietnam. Overall, 10(66.6%) were cross-sectional studies. There were five factors identified regarding antenatal care; behaviour intention, social support, accessibility of information, personal autonomy, and action situations, including economic status, availability of facility and transportation.

**Conclusion:** Antenatal care in pregnant women in developing countries is influenced by several factors, and economic status and the availability of facilities and infrastructure optimise the use of such services.

**Keywords:** Pregnancy, Prenatal care, Maternal mortality, Autonomy. (JPMA 73: S-162 [Suppl. 2]; 2023)

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### Introduction

Pregnancy is a natural process and the changes that occur in women during normal pregnancy<sup>1</sup> may cause complications. Antenatal care (ANC) helps mothers prepare for labour and understand the warning signs during pregnancy and delivery.<sup>2</sup> The use of ANC in developing countries has increased, but there are still disparities due to geographical, demographic, socioeconomic and cultural factors.<sup>3,4</sup> Inhibiting factors in the use of ANC are poverty, distance to facilities, lack of information, inadequate and poor-quality services, and cultural beliefs.<sup>5</sup>

The implementation of ANC is motivated by various factors<sup>6</sup> and it is necessary to carry out research to review the relevant factors. A review on factors related to the behaviour of pregnant women towards ANC in developing countries did not cover the intention factor.<sup>7</sup> Snehandu B. Karr's Theory of Health Behaviour<sup>8</sup> identified 5 determinants of health behaviour, namely the existence of a person's intention to act in relation to a stimulus outside himself (behaviour intention), social support, accessibility of information, The 2017 maternal mortality rate (MMR) in

low-income countries (LICs) was 462 per 100,000 live births.<sup>5</sup> The MMR in Indonesia in 2015 was 305 per 100,000 live births and the World Bank reported 2017 MMR to be 177 per 100,000 live births.<sup>9</sup> The target for reducing MMR globally by 2030 is <70 deaths per 100,000 live births as stated in the Sustainable Development Goals (SDGs).<sup>10</sup>

Acute kidney injury (AKI) is one of the consequences of low ANC coverage, and becomes an important indicator in determining the degree of public health. Globally, 86% of pregnant women have had ANC visits at least once, and 65% at least 4 times. Ethiopia (43%), Bangladesh (36.9%) and Afghanistan (20.9%) were the countries with the lowest ANC utilisation in the 2016-19 period<sup>5</sup>. One of the efforts to reduce maternal mortality is by improving maternal and neonatal health (MNH) services through service programmes.<sup>11</sup>

ANC non-compliance results in not knowing whether the pregnancy is going well, experiencing high-risk conditions and obstetric complications that can endanger the life of the mother and the foetus, causing high morbidity and mortality.<sup>12</sup> Obstetric complications include bleeding, infection, pre-eclampsia and eclampsia, complications of childbirth, and unsafe abortion. Most of these complications develop during pregnancy and can be prevented and managed.

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ANC provided by skilled health workers can reduce maternal and infant mortality during pregnancy and birth. The World Health Organisation (WHO) has recommended a minimum of 4 ANC visits for pregnant women.<sup>2</sup> ANC must be carried out routinely, according to standards, and in an integrated manner in order to prepare for a clean, safe and healthy delivery.

The current systematic review was planned to explain the factors related to ANV implementation in developing countries.

## Materials and Methods

The systematic review was conducted in June 2020 and comprised literature search on Scopus, Cumulated Index to Nursing and Allied Health Literature (CINAHL), PubMed and Garba Rujukan Digital (GARUDA) databases.

The Population, Intervention, Comparison, Outcomes and Study (PICOS)<sup>13</sup> framework was used, and the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines<sup>11</sup> were followed. The search was carried out using key words “antenatal care,” “prenatal care,” “factors,” “visit,” “attendance,” “determinant,” “enabler,” “influencing,” “affecting,” “supporting,” “pregnant women,” and “pregnancy”. The key words were combined with Boolean operators AND, OR, and NOT. Those included were cross-sectional, survey-based, prospective, mixed-method, correlational, experimental, longitudinal, cohort and case-control studies published after 2015 in either English or Bhasha. The studies included involved pregnant women and discussed the factors of ANC implementation in developing countries, and explained the factors related to such implementation in accordance with the relevant WHO recommendation.<sup>4</sup> Duplicates and articles for which full text was not available were excluded. The articles were screened for quality based on relevance, accuracy and purpose.

**Table-2:** Summary of the studies analysed.

| No | Author   | Year | Journal, Volume, Number                    | Title  | Outcome  | Conclusion   | Databases |
|----|--|------|--|--|--|--|-----------|
| 1  | Aziz Ali, S., <sup>21</sup><br>Aziz Ali, S.,<br>Feroz, A.,<br>Saleem, S.,<br>Fatmai, Z.,<br>Kadir, MS. | 2020 | BMC Pregnancy and Childbirth<br>20(1), 355 | Factors Affecting The Utilization of Antenatal Care Among Married Women of Reproductive Age in The Rural Thatta, Pakistan: Findings From A Community-Based Case-Control Study. <sup>35</sup> | D: Case-control study<br>S: 380 mothers<br>V:<br>- Dependent variable: Utilization of ANC<br>- variables: socio-demographic, socioeconomic, fertility-related, access-related factors<br>I: Structured questionnaire, GPS device<br>A: Logistic regression | Factors that influence visits are distance travelled, nulliparous, knowledge of ANC, mother who has a power source at home and lives in a nice building. | PUBMED    |

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## Results

Of the 9,733 studies initially found, 50(0.005%) were shortlisted for full-text review, and, of them, 15(30%)<sup>12-26</sup> were reviewed and analysed (Figure). There were 3(20%) each from Pakistan and Ghana, 2(13.3%) each from Nepal and India, and 1(6.66%) each from Jordan, Egypt, Yemen,

**Table-1:** Studies reviewed.

| Category                | n (%)      |
|-------------------------|------------|
| <b>Databases</b>        |            |
| Scopus                  | 12 (80)    |
| CHINAHL                 | 0 (0)      |
| PubMed                  | 3 (20)     |
| GARUDA                  | 0 (0)      |
| Total                   | 15 (100)   |
| <b>Publication Year</b> |            |
| 2015                    | 2 (13.33)  |
| 2016                    | 2 (13.33)  |
| 2017                    | 2 (13.33)  |
| 2018                    | 5 (33.33)  |
| 2019                    | 3 (20)     |
| 2020                    | 1 (6.67)   |
| Total                   | 15 (100)   |
| <b>Study Design</b>     |            |
| Cross-sectional study   | 10 (66.67) |
| Survey study            | 3 (20)     |
| Prospective study       | 1 (6.67)   |
| Case-control study      | 1 (6.7)    |
| Total                   | 15 (100)   |
| <b>Research Country</b> |            |
| Pakistan                | 3 (20)     |
| Ghana                   | 3 (20)     |
| Nepal                   | 2 (13.3)   |
| India                   | 2 (13.3)   |
| Jordan                  | 1 (6.67)   |
| Egypt                   | 1 (6.67)   |
| Yemen                   | 1 (6.67)   |
| South Africa            | 1 (6.67)   |
| Vietnam                 | 1 (6.67)   |
| Total                   | 15 (100)   |

CINAHL: Cumulated Index to Nursing and Allied Health Literature, GARUDA: Garba Rujukan Digital.

Table-2: continued from previous page

| No | Author  | Year | Journal, Volume, Number                       | Title  | Outcome   | Conclusion   | Databases |
|----|---|------|---|--|---|--|-----------|
| 2  | Fulpagare, PH, <sup>16</sup><br>Saraswat, A.,<br>Dinachandra, K., et al.                                      | 2019 | Frontiers in Public Health 7, 369             | Antenatal Care Service Utilization Among Adolescent Pregnant Women—Evidence From Swabhimaan Programme in India <sup>20</sup>                                 | D: Survey study<br>S: 2753 mothers<br>V:<br>– Dependent variable: utilization of ANC<br>– Variable bebas: household characteristic, socio-demographic characteristics<br>I: Pretested questionnaire<br>A: Descriptive statistics, chi-square, logistic regression   | Household characteristics, socioeconomic support, and knowledge and decision-making power significantly influenced ANC visits.   | Scopus    |
| 3  | Chaurasiya, SP, <sup>14</sup><br>Pravana, NK,<br>Khanal, V.,<br>Giri, D.                                      | 2019 | The Open Public Health Journal 12(1), 155-163 | Factors Affecting Antenatal Care Utilization Among The Disadvantaged Dalit Population of Nepal: A Cross-Sectional Study <sup>17</sup>                        | D: Cross-sectional study<br>S: 378 mothers<br>V:<br>– Dependent variable: Visit ANC<br>– Independent variables: Socio-cultural, economic accessibility, physical accessibility, and perceived health need factors<br>I: Structured questionnaire, observation check-list<br>A: Descriptive statistics, binary and multivariable logistic regression   | Factors that affect ANC Visits include maternal education, mother's occupation, ANC's perception of "good quality", information related to incentive programs, maternal health messages, not perceiving the behaviour of health workers as discriminators, and exposure to Female Community Health Volunteers.   | Scopus    |
| 4  | Noh, J.-W. <sup>15</sup><br>Kim, Y.-M.<br>Lee, LJ,<br>Akram, N,<br>Shahid, F,<br>Kwon, YD,<br>Stekelenburg, J | 2019 | PLoS ONE 14(4), e021398 7                     | Factors Associated With The Use of Antenatal Care in Sindh Province, Pakistan: A Population-Based Study <sup>18</sup>  | D: Survey study<br>S: 10,200 mothers<br>V:<br>– Dependent variable: Utilization of ANC<br>– Independent variables: demographic factors (mother's age, number of household members), socioeconomic factors (place of residence, mother's education level, husband's education level, household wealth index), MCH information sources.<br>I: MCH Program Indicator (Pakistan Demographic and Health Survey questionnaire from Macro International, Inc., and The Knowledge, Practice, and Coverage Survey questionnaire from John Hopkins University/Child Survival Support Program 1990)<br>A: multiple logistic regression | A total of 57.3% of mothers made ANC visits in accordance with the recommendations (4 or more visits). Several factors that support ANC visits include: the small number of family members, living in urban areas, the mother's high level of education, the large degree of household wealth, and MCH sources from LHW's, in-laws, friends, nurses/midwives. Wealth index is the most significant factor. | Scopus    |
| 5  | Hijazi, HH, <sup>12</sup><br>Alyahya, MS,<br>Sindiani, AM,<br>Saqan, RS,<br>Okour, AM.                        | 2018 | Reproductive Health 15, 106                   | Determinants of Antenatal Care Attendance Among Women Residing in Highly Disadvantaged Communities in Northern Jordan: A Cross-Sectional Study <sup>14</sup> | D: Cross-sectional study<br>S: 831 mothers<br>V:<br>– Dependent variable: Utilization of ANC<br>– Independent variables: predisposing character (age, education, parity, occupation, desire to get pregnant, region), enabling resources (health insurance, living in the central area of MCH), need factors (pregnancy-related illness and perceived health status)<br>I: Structured, pre-test survey, medical records<br>A: Multivariate logistic regression  | The use of ANC is influenced by factors related to the quality of birth services, such as receiving information and education during ANC visits, scheduled follow-up appointments, and offering dignified services. In addition, the mother's education level, desire to become pregnant, and living in the district served by the ANC clinic are determinants of ANC utilization.                         | Scopus    |
| 6  | Akouwah, JA <sup>24</sup><br>Agyei-Baffour, P.,<br>Awunyo-Vitor, D.   | 2018 | Women and Health 58(8), pp. 942-954           | Factors Associated with Optimal Antenatal Care Use in Northern Region, Ghana <sup>27</sup>   | D: Cross-sectional study<br>S: 578 mothers<br>V:<br>– Dependent variable: Optimal utilization of ANC<br>– Independent variables: maternal age, occupation, parity, location, asset index (socioeconomic status), education level, reported diseases (such as diarrhea), chronic diseases suffered before pregnancy (diabetes, hypertension, tuberculosis, asthma, sickle cell anaemia)<br>I: Questionnaire, ANC medical records<br>A: Binary logistic regression  | Education level, socioeconomic status, urban residence were significantly related to optimal use of ANC.   | Scopus    |

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| No | Author   | Year | Journal, Volume, Number  | Title   | Outcome  | Conclusion  | Databases |
|----|--|------|--|---|--|---|-----------|
| 7  | Abubakari <sup>23</sup> ,<br>Agbozo, F.,<br>Abiuro, GA                           | 2018 | Women and Health<br>58(8), pp. 942-954                         | Factors Associated with Optimal Antenatal Care Use in Northern Region, Ghana <sup>27</sup>  | D: Cross-sectional study<br>S: 578 mothers<br>V:<br>– Dependent variable: Optimal utilization of ANC<br>– Independent variables: maternal age, occupation, parity, location, asset index (socioeconomic status), education level, reported diseases (such as diarrhea), chronic diseases suffered before pregnancy (diabetes, hypertension, tuberculosis, asthma, sickle cell anaemia)<br>I: Questionnaire, ANC medical records<br>A: Binary logistic regression | Education level, socioeconomic status, urban residence were significantly related to optimal use of ANC.  | Scopus    |
| 8  | Farrag, NS <sup>25</sup> ,<br>Abdelwahab,<br>F., Ismail, GR                      | 2018 | Family Practice<br>36(4), pp. 479-485                          | Patterns and Factors Affecting Antenatal Care Utilization in Damietta Governorate, Egypt: A Retrospective Cross-Sectional Study <sup>28</sup> | D: Cross-sectional study<br>S: 755 mothers<br>V:<br>– Dependent variable: Utilization of ANC.<br>– Independent variables: place of residence, mother's occupation, husband's occupation, mother's education, husband's education, family income.<br>I: Pre-designed questionnaire, the questionnaire includes socio-demography, ANC services, ANC components obtained.<br>A: Chi-square  | The factors of high maternal education, living in urban areas, husband's education, and high family income are associated with regular use of ANC. Primigravida mothers have more regular visits. Accessibility significantly improves ANC utilization. | PUBMED    |
| 9  | Sharma, A <sup>20</sup> ,<br>Meshram, P,<br>Pandey, D., et<br>al,                | 2018 | Indian Journal of Community Health<br>30(1), 56-62             | Utilization of Antenatal Services and Concerning Factors: A Community Based Study <sup>29</sup>   | D: Prospective study<br>S: 396 mothers<br>V:<br>– Dependent variable: visit ANC<br>– Independent variables: sociodemographic factors (age, education, mother's occupation, family type, religion, husband's education, husband's occupation, pregnancy registration time)<br>I: Predesigned, pretested, semi-structured questionnaire<br>A: Chi-square test  | Factors that were significantly related to ANC visits were mother's education, husband's education, mother's occupation, family type, and time of pregnancy registration.   | Scopus    |
| 10 | Sakeah, E. <sup>22</sup> ,<br>Okawa, S.,<br>Oduro, AR, et<br>al.                 | 2017 | Reproductive Health<br>15, 106                                 | Determinants of Attending Antenatal Care At Least Four Times in Rural Ghana: Analysis of A Cross-Sectional Survey <sup>36</sup>               | D: Cross-sectional study<br>S: 1497 mothers<br>V:<br>– Dependent variable : ANC visit 4+<br>– Independent variables: geographic location, age, marital status, education level, husband's education level, religion, national health insurance status, wealth index, preferred gestational age.<br>I: Health Demographic Surveillance System, structured questionnaire<br>A: Multivariable logistics   | Factors that were significantly associated with ANC visits were marital status, national health insurance status, husband's education level, and wealth index.  | Scopus    |
| 11 | Othman, S. <sup>26</sup> ,<br>Almabashi, T.,<br>Alabed, AA,<br>Abdulwahed,<br>A. | 2017 | Malaysian Journal of Public Health Medicine<br>17(3), pp. 1-14 | Factors Affecting Utilization of Antenatal Care Services in Sana'a City, Yemen <sup>37</sup>  | D: Cross-sectional study<br>S: 460 mothers<br>V:<br>– Dependent variable : Utilization of ANC<br>– Independent variables: socio-demographic factors, economic factors, obstetrical characteristics,<br>I: structured questionnaire<br>A: Bivariate analysis  | Maternal education factors, area of residence, maternal age at first pregnancy, gravid, parity, and number of children born alive.  | Scopus    |

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| No | Author   | Year | Journal, Volume, Number                               | Title   | Outcome   | Conclusion   | Databases |
|----|--|------|---|---|---|--|-----------|
| 12 | Muhwava, LS <sup>13</sup> ,<br>Morojele, N.,<br>London, L                                | 2016 | BMC Pregnancy and Childbirth<br>16, 18                | Psychosocial Factors Associated with Early Initiation and Frequency of Antenatal Care (ANC) Visits in A Rural and Urban Setting in South Africa: A Cross-Sectional Survey <sup>15</sup>         | D: Cross-sectional study<br>S: 829 mothers<br>V:<br>- Dependent variable :<br>1) Time of visit (early or late)<br>2) Frequency (adequate or inadequate)<br>- Independent variables: psychosocial factors (self-esteem), cultural influences, religiosity, social capital, social support, desire to get pregnant, partner characteristics, mental health, substance use.<br>I: Questionnaire<br>A: Bivariate and multivariate logistic regression | Region, mother's education and media exposure were significantly associated with ANC visits.   | Scopus    |
| 13 | Basharat, J. <sup>19</sup> ,<br>Kamal, A.,<br>Manzoor, I.,<br>Nauman, U.                 | 2016 | Pakistan Pediatric Journal<br>40(4), pp. 242-253      | Socio-Demographic Differentials for Utilization of Antenatal Health Care Among Pakistani Women: A Negative Binomial-Logit Hurdle (HNBLOGIT) Regression Model Approach (1990-2013) <sup>24</sup> | D: Survey study<br>S: 30,491 mothers<br>V:<br>- Dependent variable : Visit ANC<br>- Independent variables: socioeconomic and demographic factors<br>I : Pakistan Demographic and Health Survey 1990-1991, 2006-2007, and 2012-2013<br>A: Negative binomial-logit hurdle (HNBLOGIT) regression   | Region, mother's education and media exposure were significantly associated with ANC visits.   | Scopus    |
| 14 | Ha, BTT. <sup>17</sup> ,<br>Taç, P.V.,<br>Duc, DM.,<br>Duong, D., et al.                 | 2015 | International Journal of Women's Health<br>7, 699-706 | Factors Associated with Four or More Antenatal Care Services Among Pregnant Women: A Cross-Sectional Survey in Eight South Central Coast Provinces of Vietnam <sup>19</sup>                     | D: Cross-sectional study<br>S: 907 mothers<br>V:<br>- Dependent variable : ANC 4+<br>- variables: socio-demographic characteristics, social determinants, sex equality, husband's involvement<br>I: Semi-structured questionnaire<br>A: Multivariate logistic regression  | Factors that were significantly related to ANC visits were ethnicity, education, occupation, household income, knowledge of ANC4+, financial support from husband.           | Scopus    |
| 15 | Acharya, D. <sup>18</sup> ,<br>Khanal, V.,<br>Singh, JK.,<br>Adhikari, M.,<br>Gautam, S. | 2015 | BMC Research Note<br>8(1), pp. 4-9                    | Impact of Mass Media on The Utilization of Antenatal Care Services Among Women of Rural Community In Nepal <sup>18</sup>  | D: Cross-sectional study<br>S: 205 mothers<br>V:<br>- Variabel terikat : Pemanfaatan ANC<br>- Variabel bebas : paparan media massa<br>I: Structured questionnaire<br>A: Logistic regression   | Mass media has a positive effect on the use of ANC. In addition, maternal education also affected ANC utilization, while occupation did not significantly affect ANC visits. | Scopus    |

South Africa and Vietnam. Overall, 10(66.6%) were cross-sectional studies (Table 1).

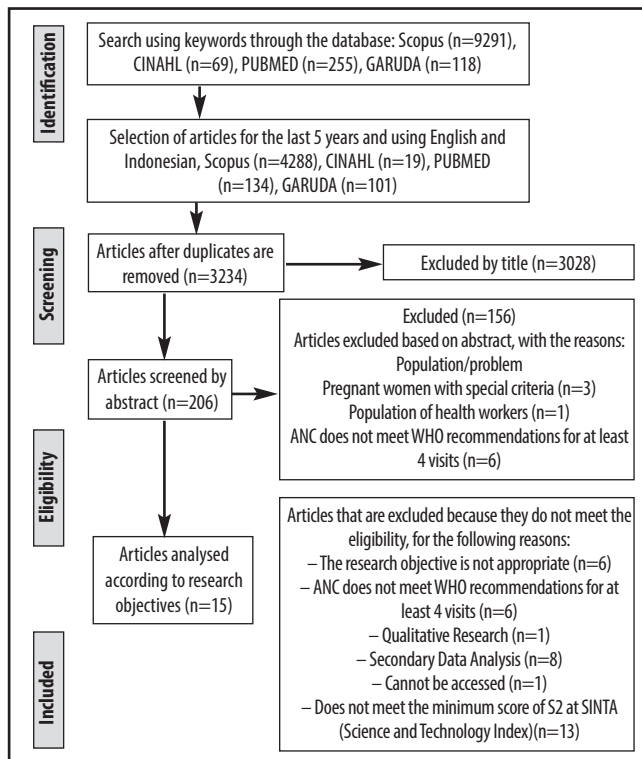
There were five factors identified regarding antenatal care; behaviour intention,<sup>12,13</sup> social support,<sup>14-17</sup> accessibility of information,<sup>14,16,17,21</sup> personal autonomy<sup>14,16</sup> and action situations,<sup>12,14-17,20-26</sup> including economic status, availability of facility and transportation.

## Discussion

The desire of women for pregnancy is an important factor in determining approach towards ANC. Mothers who have the intention to become pregnant are 1.82 times more likely to have enough ANC visits compared to mothers who have no desire to become pregnant.<sup>16,14</sup> ANC is an important factor in

determining the timing of ANC initiation.<sup>15</sup> The Health Behaviour Theory of Snehandu B. Karr<sup>8</sup> explains that behaviour is influenced by a person's behaviour intention to act in relation to an object or stimulus outside oneself. Person behaves because of a desire, intentional or because it was planned. This is in line with the Theory of Planned Behaviour<sup>8</sup> which conveys that the behaviour displayed by the individual arises because of the intention to behave. Ajzen and Fishbein say that intention is the best indicator to predict behaviour, especially when someone acts under the control of their will. Intentions are formed by three factors, namely attitudes, subjective norms, and behavioural control beliefs.<sup>16</sup>

Intention is a predictor of health behaviour for pregnant women in developing countries.



CINAHL: Cumulated Index to Nursing and Allied Health Literature, GARUDA: Garba Rujukan Digital, WHO: World Health Organisation.

**Figure:** Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flowchart.

The association of mothers with a group being fairly treated by Female Community Health Volunteers (FCHVs) during pregnancy were associated with 4 or more ANC visits. This is because positive past experiences encourage the use of ANC in the future, and negative experiences make pregnant women reluctant to make ANC visits. Pregnant women exposed to FCHV were about twice as likely to use ANC as their counterparts, because exposure to FCHV increased the likelihood of sharing information about health services.<sup>17</sup> The involvement of Lady Health Workers (LHWs), parents-in-law, friends/relatives, and nurses/midwives in providing information related to MNH shows that there is social support for pregnant women from the surrounding environment. The support provided is in the form of information support. The more education and information are given to mothers, the more likely they are to make at least 4 ANC visits.<sup>18</sup> Financial support from the husband is considered an important factor in increasing the use of ANC services.<sup>19</sup> Social and economic support through Public Distribution System (PDS) and Integrated Child Development Services (ICDS) can strengthen the ANC programme. More women who attend Village Health Sanitation and Nutrition Day

(VHSND) meetings have access to ICDS services and can take advantage of services and counselling.<sup>20</sup>

Karr<sup>8</sup> states that a person's behaviour is influenced by support from the surrounding community (social support). One's behaviour tends to require legitimacy from the surrounding community. If a person's behaviour contradicts or does not get support from the community, then that person will feel uncomfortable. The forms of support can be in the form of emotional support, appreciation, instrumental and through information.<sup>21</sup> The life of traditional communities in some developing countries is still largely controlled and influenced by customs and traditions.<sup>22</sup> People in rural areas generally have very close relationships with one another. Social support for pregnant women can come from the environment, friends, family, parents, husbands and health workers. Social support is needed by a woman during pregnancy, especially from those closest to her.<sup>23</sup> Pregnant women feel comfortable when there is support from the people around them. In addition, pregnant women who get support will have a high motivation to undertake ANC.

The amount of information obtained by pregnant women is related to higher education level, because higher education also increases knowledge and awareness about health.<sup>17</sup> Pregnant women exposed to mass media at least once a week were more likely to use ANC services than those who were not exposed at all. Exposure to electronic media enables mothers to increase their understanding of the benefits and uses of ANC.<sup>24</sup> The exchange of information between pregnant women and healthcare providers during consultations also affects the frequency of ANC visits.<sup>14</sup> MNH information plays an important role in determining the use of ANC. Women who receive information from the nurse/agency tend to make the recommended ANC visits.<sup>18</sup> However, not all pregnant women in developing countries can have easy access to information because of the poor economic conditions and inadequate infrastructure.

The power to take one's own decisions, or autonomy, is related to the use of ANC services. Higher autonomy is reflected in mothers' ability to decide whether or not to attend ANC, and makes mothers more likely to take advantage of such services.<sup>20</sup> The higher a woman's education level is, the more chances she has of involvement in household decision-making, better communication with partners, negotiation skills, and the ability to demand adequate services. The wife's involvement in household decision-making is inseparable from the husband's education level. Educated husbands may be more aware of the benefits of ANC.<sup>17</sup>

The existence of autonomy or personal freedom to make decisions is one of the determinants of health behaviour.<sup>25</sup> The concept of women's autonomy includes all dimensions.<sup>26</sup>

Among the studies reviewed, the highest ANC visits in the first semester of pregnancy were carried out by pregnant women with high economic status.<sup>20</sup> Mothers with the highest wealth index were approximately 6 times more likely to have the recommended ANC visits than mothers with lower wealth index. Women belonging to the upper economy class have more capacity to pay for healthcare, ANC visits, and costs related to services, such as transportation, than women in the lower segments of economy.<sup>18</sup> The poorest women have difficulty accessing ANC<sup>22</sup>, particularly in households with low economic levels, and cannot optimise the use of ANC services because of the direct and indirect costs associated with it, such as transportation, purchase of medicines, and other supplies.<sup>27,28</sup> Pregnant women who work and have an income also have control over the things that affect their lives as far as their healthcare needs are concerned. Household wealth significantly affects the type of facility to access ANC at.<sup>22</sup>

Economic status is the position of a person or family in society based on monthly income.<sup>31</sup> The highest priority for families with low incomes is basic needs. A person's economic status will determine the availability of the necessary facilities for certain activities. In addition, developing countries rely more on the primary sector as their main income.

Distance and availability of transportation facilities are related to the use of ANC services. Distance from place of residence and healthcare facilities as well as ease of transportation are important factors in increasing ANC compliance because accessibility affects patient satisfaction. The main reasons reported by the mothers included lack of ANC information and the distance between their homes and health facilities.<sup>17,28,30</sup> Empirical studies have shown that there is a relationship between the location of residence and the use of ANC.<sup>32</sup> In most developing countries, urban residents; use of ANC is more than those living in rural areas, which, among other things, may well be because of poor roads in rural communities.<sup>27</sup>

Conditions and situations falling under the 'action situations' category are one of the determinants of health behaviour according to Kar<sup>8</sup>. Increased access to ANC facilities is influenced by reduced distance, travel time or travel costs, resulting in an increase in service usage.<sup>33,34</sup>

The low level of the economy in developing countries causes a lack of equitable development. Infrastructure

problems in developing countries that are not evenly distributed prevent people from utilising health services.

## Conclusion

ANC helps mothers prepare for labour and understand the warning signs during pregnancy. ANC in pregnant women in developing countries is influenced by several factors, such as intention, social support, availability of information, personal autonomy, and situational action. Economic status, and the availability of facilities and infrastructure optimise the use of ANC services. The availability of information from various sources increases mothers' understanding of the benefits and uses of ANC for their health and good pregnancy outcomes. Nurses and midwives have an important role in providing information related to MNH.

**Limitation:** The current systematic review was not registered with the International Prospective Register of Systematic Reviews (PROSPERO).

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**Conflict of Interest:** None.

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