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The Importance of Folic Acid Monitoring In Pregnancy: Implications For Maternal and Child Health in Gynecology

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ABSTRACT
A documentary review was carried out on the production and publication of research papers related to the study of the variables FOLIC ACID, PREGNANCY and GYNECOLOGY.The purpose of the bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database during the period 2017-2022 by Latin American institutions, achieving the identification of 55 publications. The information provided by this platform was organized through graphs and figures categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics have been described, the position of different authors regarding the proposed theme is referenced through a qualitative analysis. Among the main findings made through this research, it is found that the United Kingdom with 6 publications was the country with the highest scientific production registered in the name of authors affiliated with institutions in that nation. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material regarding the study of the different didactic methodologies for teaching in the area of general medicine was Medicine with 49 published documents, and the most used Type of Publication during the period indicated above were Journal Articles with 82% of the total scientific production.

Keywords: Folic acid, Pregnancy, Gynecology.

1. INTRODUCTION

In the field of gynecology and maternal health, few factors are as crucial and far-reaching as the control of folic acid levels during pregnancy. Folic acid, a water-soluble B vitamin, plays an indispensable role in various biological processes, especially during periods of rapid growth and development. Its importance in the context of pregnancy extends beyond the individual and affects both maternal and infant health outcomes. Adequate folic acid intake and careful monitoring are essential to mitigate the risks associated with deficiencies, ensuring the well-being of both mother and fetus.

During this transformative period, the demand for essential nutrients skyrockets to support the growth and development of the developing fetus. Folic acid, also known as folate, stands out as a key player in promoting healthy pregnancy progression. Their involvement in DNA synthesis, cell division, and amino acid metabolism underscores their vital role in the early stages of embryonic development. Therefore, the control of folic acid levels becomes a fundamental aspect of antenatal care, aimed at preventing possible complications that may arise from its deficiency.

The implications of inadequate intake or absorption of folic acid during pregnancy are profound and far-reaching, affecting both maternal and infant health. DTN neural tube defects, such as spina bifida and anencephaly, are among the best-documented consequences of folic acid deficiency during the first trimester of pregnancy. These devastating birth defects can lead to lifelong disabilities and even mortality in severe cases. In addition, insufficient folic acid intake has been associated with increased risks of preterm birth, low birth weight, and developmental abnormalities.

As the importance of folic acid in pregnancy became apparent, public health initiatives advocating folic acid supplementation and dietary modifications gained traction. Prenatal vitamins and fortified foods were introduced to close potential nutritional gaps and prevent folic acid deficiencies. However, the effectiveness of these interventions depends largely on accurate monitoring of maternal folic acid levels. Tailoring

supplementation to individual needs and addressing deficiencies in a timely manner is critical to ensuring optimal maternal and child health outcomes.

The importance of controlling folic acid levels during pregnancy in the field of gynecology and maternal health cannot be underestimated. The impact of folic acid on embryonic development, along with its potential to prevent serious birth defects, underscores the need for careful monitoring and proactive intervention. By recognizing the implications of folic acid deficiencies and integrating accurate follow-up into prenatal care, healthcare providers can contribute to healthier pregnancies, reduce the burden of preventable complications, and promote the well-being of both mothers and their children. For this reason, this article seeks to describe the main characteristics of the compendium of publications indexed in the Scopus database related to the variables FOLIC ACID, PREGNANCY and GYNECOLOGY, as well. Such as the description of the position of certain authors affiliated with institutions, during the period between 2017 and 2022.

2. General Objective

To analyze, from a bibliometric and bibliographic perspective, the preparation and publication of research papers in high-impact journals indexed in the Scopus database on the variables Folic Acid, Pregnancy and Gynecology during the period 2017-2022.

3. METHODOLOGY

This article is carried out through a mixed orientation research that combines the quantitative and qualitative method.

On the one hand, a quantitative analysis of the information selected in Scopus is carried out under a bibliometric approach of the scientific production corresponding to the study Folic Acid, Pregnancy and Gynecology. On the other hand, examples of some research works published in the area of study indicated above are analyzed from a qualitative perspective, based on a bibliographic approach that allows describing the position of different authors regarding the proposed topic. It is important to note that the entire search was carried out through Scopus, managing to establish the parameters referenced in Figure 1.

3.1. Methodological design

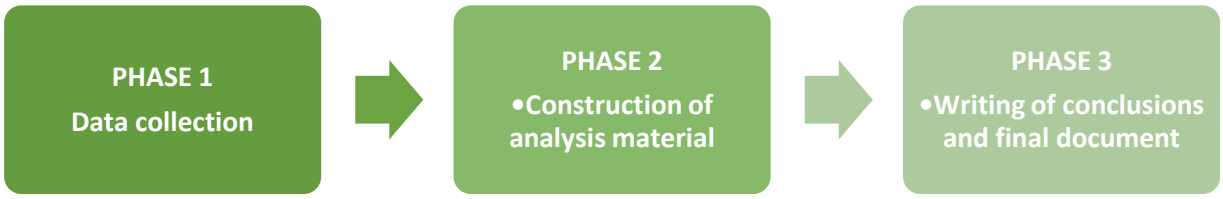

Figure 1. Methodological design
Source: Own elaboration

3.1.1 Phase 1: Data Gathering

Data collection was carried out from the Search tool on the Scopus website, where 55 publications were obtained from the choice of the following filters:

- TITLE-ABS-KEY (folic AND acid, AND pregnancy, AND gynecology) AND PUBYEAR > 2016 AND PUBYEAR < 2023
- Published documents whose study variables are related to the study of the variables Folic Acid, Pregnancy and Gynecology
- Limited to the period 2017-2022.
- Without distinction of country of origin.
- Without distinction of area of knowledge.
- Without distinction of type of publication.

3.1.2 Phase 2: Construction of analysis material

The information collected in Scopus during the previous phase is organized and then classified by graphs, figures and tables as follows:

- Co-occurrence of words.
- Country of origin of the publication.
- Area of knowledge.
- Type of publication.

3.1.3 Phase 3: Drafting of the conclusions and final document

In this phase, the analysis of the results previously yielded is carried out, resulting in the determination of conclusions and, consequently, the obtaining of the final document.

4. RESULTS

4.1 Word co-occurrence

Figure 2 shows the co-occurrence of keywords found in the publications identified in the Scopus database.

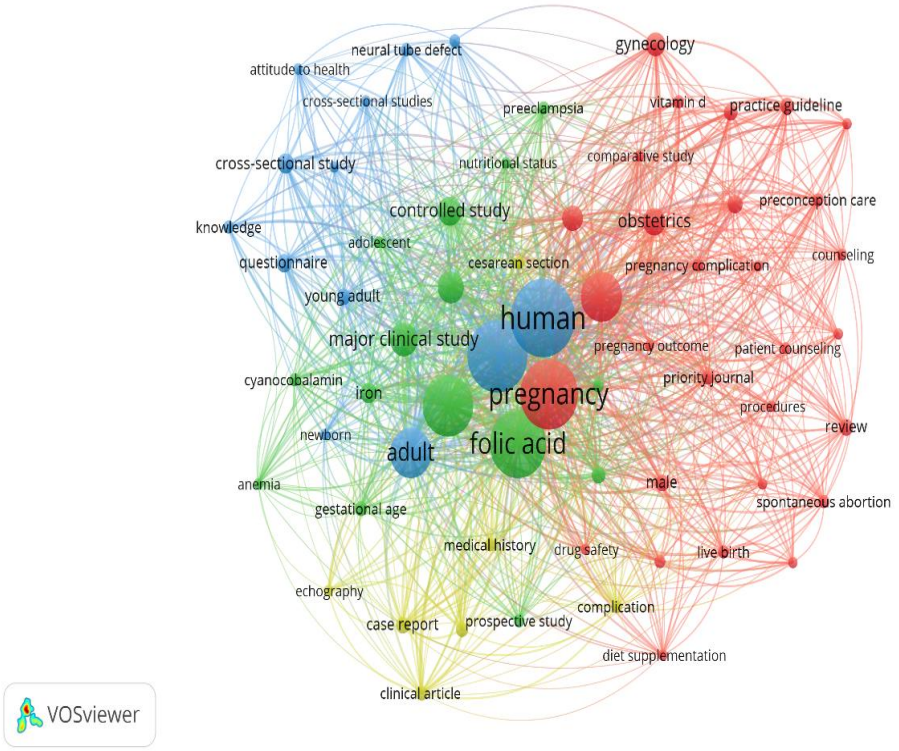

Figure 2. Word co-occurrence
Source: Own elaboration (2023); based on data exported from Scopus.

Folic acid was the most frequently used keyword within the studies identified through the execution of Phase 1 of the Methodological Design proposed for the development of this article. Pregnancy is also among the most frequently used variables, associated with variables such as Medical History, Maternal and Infant History, Supplementary Diet, Prenatal Control, Pregnancy Outcome. From the above, it is striking the importance of controlling folic acid levels in pregnant women since it is of crucial importance to ensure the correct development of the fetus, and with this minimize the risks at the time of birth and promote excellent well-being for both the woman and the baby. Taking into account the importance of monitoring folic acid, it is essential to graft prenatal vitamins containing folic acid and to follow a balanced diet rich in folate that helps meet nutritional needs. Awareness of regular antenatal care and proper consultation with gynecologists is critical to effective control and monitoring and also to address irregularities of any potential impairments, which ultimately lead to a healthier pregnancy and improved maternal and infant well-being in pregnant women.

4.2 Distribution of scientific production by year of publication

Figure 3 shows how scientific production is distributed according to the year of publication.

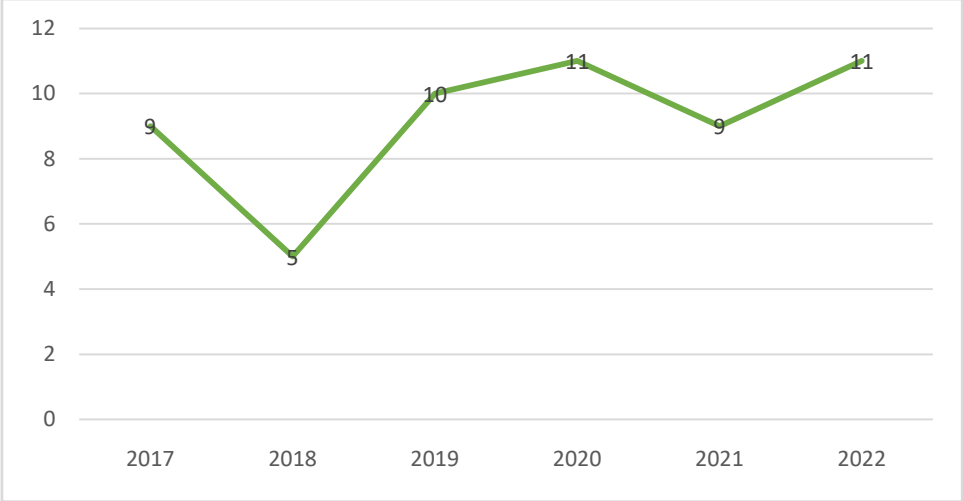

Figure 3. Distribution of scientific production by year of publication.
Source: Own elaboration (2023); based on data exported from Scopus

Among the main characteristics evidenced by the distribution of production
scientific by year of publication, a level of number of publications registered in Scopus was noted in the years 2022-2022, reaching a total of 11 documents published in journals indexed on said platform. This can be explained thanks to articles such as the one entitled "The association between vitamin D levels in the second trimester of pregnancy and gestational diabetes mellitus" The purpose of this study is to evaluate the relationship between vitamin D levels in the second trimester of pregnancy and the risk of GDM. Methods: Based on inclusion and exclusion criteria, 247 pregnant women attended the fourth Shijiazhuang hospital (the affiliated obstetrics and gynecology hospital of Hebei Medical University) for investigation during the period from January 1, 2019 to December 31, 2020. 25(OH)D levels in the second trimester (16 to 20 weeks) and the 75 g oral glucose tolerance test (OGTT) were checked at 24 to 28 weeks of pregnancy. Sociodemographic data were collected from a questionnaire. Multivariate logistic regression was used to analyze the relationship between vitamin D levels and GDM. Results: The incidence of GDM in the observation group (25(OH)D ≤ 26 ng/ml) was higher than in the control group (25(OH)D > 26 ng/ml) (p = 0.039). Compared to the control group, the observation group had significantly higher fasting plasma glucose (GAP) (4.7 [4.5–5.0] mmol/L vs. 4.6 [4.4–4.8] mmol/L, p = .012). Across the study, the level of 25(OH)D was negatively correlated with FPG (r = −0.164, p = 0.010). After adjusting for age, pre-pregnancy BMI, parity, and adverse pregnancy history, compared to the observation group (25(OH)D ≤ 26 ng/mL), the risk of developing GDM decreased by 50.9% in the control group (25(OH)D ≤ 26 ng/mL).)D > 26 ng/mL) (odds ratio [OR] = 0.491, 95% confidence interval [CI] = 0.243–0.989, p = .047). Bottom Line: Adequate vitamin D levels during the second trimester of pregnancy may reduce the risk of GDM.(Wang, 2022)

4.3 Distribution of scientific production by country of origin.
Figure 4 shows how scientific production is distributed according to the nationality of the authors.

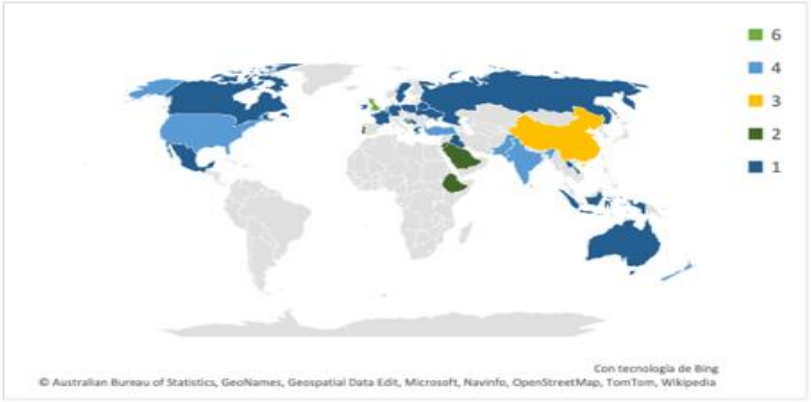

Figure 4. Distribution of scientific production by country of origin.
Source: Own elaboration (2023); based on data provided by Scopus.

Within the distribution of scientific production by country of origin, records from institutions were taken into account, establishing the United Kingdom, as the country of that community, with the highest number of publications indexed in Scopus during the period 2017-2022, with a total of 6 publications in total. In second place, India and New Zealand with 4 scientific papers, and China occupying the third place presenting to the scientific community, with a total of 3 papers among which is the article entitled "Spectrum of fetal congenital anomalies: a hospital study from northern India" This study was carried out with the aim of estimating the incidence of congenital anomalies and presenting the spectrum of various congenital anomalies. Material and methods: This cross-sectional study was conducted in the government's department of obstetrics and gynecology. Kathua College of Medicine, Jammu J&K w.e.f. From October 1, 2019 to March 31, 21. Patients attending antenatal OPD with congenital malformations diagnosed by ultrasound and patients admitted to the delivery room who aborted a baby with congenital anomalies at birth were included in the study. Results: During the study period, 5663 births were registered, of which 64 presented congenital anomalies. The incidence of birth defects in the present study was 1.1%. The predominant system involved was the central nervous system 54.6%, followed by the cardiovascular system 12.5%, the musculoskeletal system 7.8%, the renal system 6.2%, and the gastrointestinal system 4.6%. Bottom Line: Congenital anomalies cannot be totally prevented, but with awareness among the masses and good prenatal care, most defects can be detected in the early prenatal period, when medical termination of pregnancy can be offered to women with lethal defects, which will reduce maternal morbidity and parental mental agony(Nishupriya, 2022)

4.4 Distribution of scientific production by area of knowledge

Figure 5 shows the distribution of the preparation of scientific publications based on the area of knowledge through which the different research methodologies are implemented.

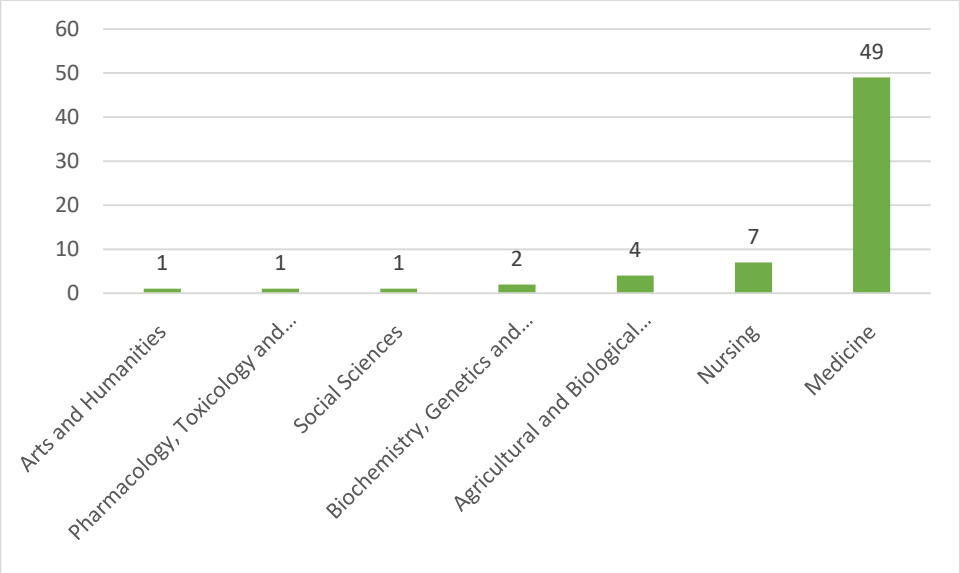

Figure 5. Distribution of scientific production by area of knowledge.
Source: Own elaboration (2023); based on data provided by Scopus.

Medicine was the area of knowledge with the highest number of publications registered in Scopus with a total of 49 documents that have based their variable methodologies FOLIC ACID, PREGNANCY and GYNECOLOGY. In second place, Nursing with 7 articles and Agricultural and Biological Sciences in third place with 4. The above can be explained thanks to the contribution and study of different branches, the article with the greatest impact was registered by the area of Medicine entitled "Study on the relationship between recurrent miscarriage and methylenetetrahydrofolate reductase, the polymorphism of the plasminogen-1 activator inhibitor gene and the serum concentration of folate in pregnant women of adequate age" whose scope of study aims to investigate the association between abortion Methylenetetrahydrofolate reductase (MTHFR) gene polymorphism and plasminogen activator-1 inhibitor (PAI-1) in age-appropriate pregnant women, and to observe the difference in serum concentration of patients with different MTHFR genotypes after taking different doses of folic acid. Methods A prospective case-control study was conducted, eleven pregnant women with a history of unexplained RSA and gestation of less than 12 weeks who visited the Department of Obstetrics and Gynecology of Xuancheng People's Hospital of Anhui Province from January 2019 to June 2021. were enrolled in the RSA group and 100 normal women of childbearing potential from the same area with no history of miscarriage were included in the control group. After venous blood was drawn, polymorphisms of the MTHFR

C677T gene, A1298C PAI-1, and serum folic acid concentration were detected. The comparison between the groups of measurement data with normal distribution adopts the t-test, and the counting data adopts the t-test $\chi 2$.(Nianbao, 2022)

4.5 Type of publication

In the following graph, you will see the distribution of the bibliographic find according to the type of publication made by each of the authors found in Scopus.

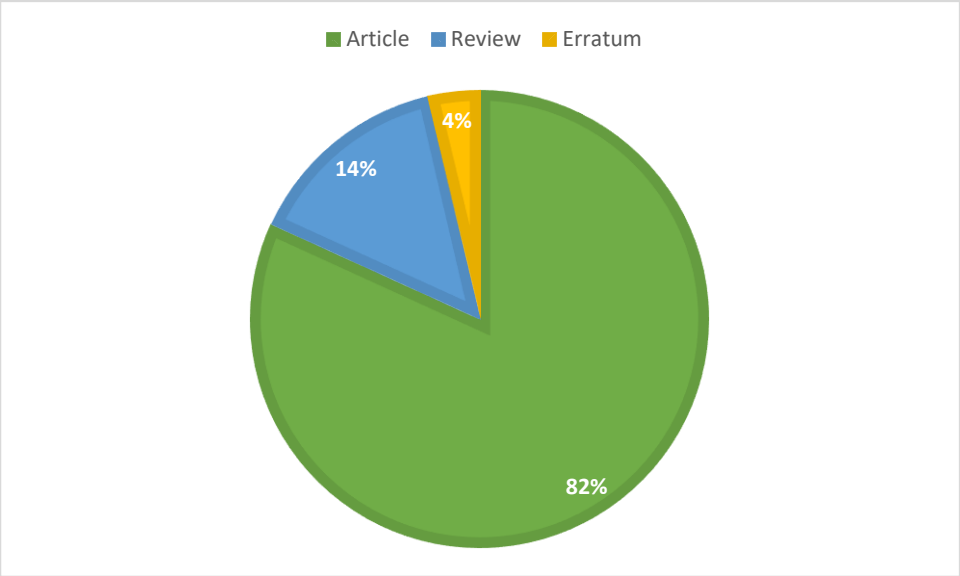

Figure 6. Type of publication.
Fountain: Own elaboration (2023); based on data provided by Scopus.

The type of publication most frequently used by the researchers referenced in the body of this document was the one entitled Journal Article with 82% of the total production identified for analysis, followed by Journal with 14%. Errata are part of this classification, representing 4% of the research papers published during the period 2017-2022 in journals indexed in Scopus. In this last category, the one entitled "Knowledge about neural tube defects and their prevention through the use of folic acid among women in Faisalabad, Punjab, Pakistan: a cross-sectional survey" stands out. The objective of this study was to assess the levels of knowledge about neural tube diseases and the use of folic acid among women attending the gynecology department of the DHQ Hospital. Faisalabad, Pakistan. Design: Cross-sectional survey. Setting: The gynecology department of the Central District Hospital (DHQ) in Faisalabad, Pakistan. Participants: Three hundred and fifty-five married women. Primary and secondary outcome measures: Primary outcome measures included knowledge about neglected tropical diseases and knowledge about folic acid use. (Yasmin, 2022)

5. CONCLUSIONS

Through the bibliometric analysis carried out in this research work, it was possible to establish that the United Kingdom was the country with the highest number of published records for the variables FOLIC ACID, PREGNANCY and GYNECOLOGY. with a total of 6 publications in the Scopus database. In the same way, it was possible to establish that the application of theories framed in the area of Medicine, it is important to highlight that a regular control of folic acid levels in the state of pregnancy guarantees a favorable control for an excellent healthy development for the neural tube of the fetus. Proper follow-up can be done through blood tests or by making sure that the pregnant woman takes the recommended daily dose of folic acid supplements. Not getting enough folic acid during pregnancy can increase the risk of neural tube defects, which can have serious, lifelong consequences for the baby. Therefore, checking folic acid levels helps gynecologists identify any deficiencies and recommend appropriate interventions for maternal and child health, such as folic acid fortification or recommending treatment to adjust your diet. In addition, getting enough folic acid during pregnancy is associated with other positive outcomes, including a reduced risk of other birth defects, such as cleft lip and palate, as well as potential benefits for the mother, such as reduced risk of preeclampsia and preterm birth. Finally, monitoring folic acid levels during pregnancy is important to ensure that pregnant women get an adequate intake, thereby reducing the risk of neural tube defects and potentially benefiting the health of the mother and baby.

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