

Bacterial Vaginosis in women of child-bearing age in Latin America: A Literature Review

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World Journal of Advanced Research and Reviews, 2024, 24(02), 1620–1631

Publication history: Received on 07 October 2024; revised on 14 November 2024; accepted on 16 November 2024

Article DOI: <https://doi.org/10.30574/wjarr.2024.24.2.3492>

Abstract

Bacterial vaginosis is a pathology related to vaginal tract infections, which produces an inflammation of the cervix caused by the excessive growth of bacteria such as *Gardnerella Vaginalis*, with a prevalence of 30% in females overall.

Objective: To analyze Bacterial Vaginosis in women of childbearing age in Latin America.

Methodology: A bibliographical review of descriptive type was carried out through selected articles from scientific databases such as Scopus, Web of Science, Pubmed, ProQuest, Redalyc, Springer, and SciELO, among others, supported by keywords from health descriptors such as DeCS; to select the articles, we applied as inclusion criteria those that were published between 2017-2022 in English, Spanish, and Portuguese and excluded: theses, monographs, editorials, and articles published outside the established time frame.

Results: Of the papers analyzed for this article, 32% showed a high prevalence in Latin America, and the risk factors included contraceptive methods. Complications were Pelvic Inflammatory Disease (PID), infertility, premature delivery, and neonatal damage; in the therapeutic approach, fluconazole + secnidazole and metronidazole were considered the drugs of choice. As for nursing interventions, they are directed toward the promotion and prevention of bacterial vaginosis.

Conclusions: Bacterial vaginosis is a condition that occurs mainly in women of childbearing age and, if not treated early, could lead to complications

Keywords: Bacterial vaginosis; Latin America; Prevalence; Risk factors; Nursing

1. Introduction

Bacterial vaginosis (BV) is an inflammation of the walls of the vagina resulting from colonization by Gram (-) anaerobic bacteria, such as *Gardnerella vaginalis*, *Mobiluncus spp* and *Mycoplasma hominis* [1].

The World Health Organization WHO [2] mentions that this disease has a prevalence of 30% in the global female population and an estimated incidence of 4-15% in sexually active adolescents during the year. On the other hand, the Clinical Practice Guideline GPC [1] mentions that bacterial vaginosis occurs in 32% of pregnant women. Likewise, the Pan American Health Organization (PAHO) indicates that the prevalence of BV was 69.1% among which unmarried women and intrauterine device carriers IUD were at high risk for bacterial vaginosis [3]. In addition, the Scientific Society of San Fernando, Peru (SCSF), indicates that BV belongs to vaginal infections

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[4] And a study in Chile mentions that this type of pathology is usually repeated about two to four times a year in women of childbearing age, increasing its incidence [5].

In Ecuador, the National Institute of Statistics and Census (INEC) 2017 mentions that BV is one of the main causes of ambulatory morbidity in women [6]. Likewise, it is indicated that BV represents 40% to 50% of the different types of vaginal infections, and is responsible for a high percentage of maternal-perinatal morbimortality. In the *Revista Ciencias de la Salud de Manabí - Ecuador*, a study was published in 250 women of childbearing age, 39% of whom were diagnosed with BV; similarly, other research conducted in Cuenca-Ecuador showed a prevalence of 16.7% of this pathology [7].

Bacterial vaginosis is associated with several risk factors, such as: recurrent sexual activity, multiple sexual partners [two different sexual partners in a period of less than six months] [8], use of contraceptive methods (intrauterine device, IUD), inadequate intimate hygiene practices, sociodemographic factors such as, non-white race (51% African American, 32% Mexican American) and low level of education [9]; In addition, epidemiological evidence has identified that women who have sex at an early age (between fifteen and sixteen) and sex workers have a higher probability of contracting this disease [10]. It is important that health personnel recognize these factors, because they can help in the prevention and promotion of this disease.

The clinical features are characteristic of bacterial vaginosis in women: grayish discharge, pruritus, characteristic fishy odor and sometimes dyspareunia [11], the same that generate an alteration in the well-being of the patient, however, 50% of women are asymptomatic, which makes the diagnosis in these patients complex [12]. This pathology is considered a public health problem in women of childbearing age (15 to 49 years of age), because, in retrospective and prospective studies conducted in 2020, indicate that bacterial vaginosis when not treated in time can cause pelvic inflammatory disease PID [7]; in addition, infertility and in women in gestation period can cause premature births [13,14].

Bacterial vaginosis has two diagnostic methods, the first is Amsel's method which indicates different criteria to diagnose BV such as: pH > 4.5, grayish color of the vaginal discharge, amine test which is positive when the sample releases a fishy odor and finally the identification of clue cells which indicate the presence or absence of Lactobacillus. The second method is by Nugent, who identifies the presence of different types of bacteria such as Lactobacillus, coccobacillus and Gram-negative bacilli, which are assigned a score of 0-10, depending on the number of microorganisms present in the sample [15].

Generally, this pathology has different pharmacological treatments such as metronidazole, tinidazole, clarithromycin and gentamicin that should be applied in a timely manner to prevent complications or sequelae of bacterial vaginosis, some articles indicate that this type of treatment can be administered to the partner to avoid coinfection and reduction of the burden of BV, however, these drugs are focused only on women who present the previously described symptomatology [16,17].

Because of the aforementioned, this disease is considered a gynecological- obstetric health problem due to its high recurrence in primary health care, altering the complete physical, psychological and social state [17]. The health personnel, especially the nursing area controls important axes in health such as; promotion, prevention, cure and rehabilitation; these processes are focused on the education of the patient with BV, in addition to how to carry out the pharmacological and non-pharmacological treatment.

Finally, the present literature review "Bacterial vaginosis in women of childbearing age in Latin America" investigated the prevalence of this disease in Latin

American countries, risk factors, therapeutic approach, complications that may occur and nursing interventions.

2. Methodology

The present bibliographic review is descriptive and was carried out through searches of scientific articles found in databases such as: Scopus, PubMed, Elsevier, Medigraphic, ProQuest, Springer, Scielo, Redalyc, Europe, Web of Science, Taylor and Francis, Ovid, Dialnet, and Researchgate. The search was performed in an advanced form with the support of keywords chosen from health descriptors such as DeCS: "Bacterial Vaginosis", "Prevalence", "Risk Factors", "Latin America", and "Nursing". Subsequently, with the aforementioned terminology, the search equations were performed with the Boolean operators AND, OR, NOT: "Treatment AND bacterial vaginosis AND Latin America", "Prevalence AND Bacterial Vaginosis", "Prevalence AND Bacterial Vaginosis NOT Risk Factors", "Prevalence AND bacterial vaginosis AND

risk factors", "Bacterial Vaginosis AND Nursing OR Nursing Education", "nursing AND Bacterial Vaginosis", "Preterm birth AND vaginal microbiota".

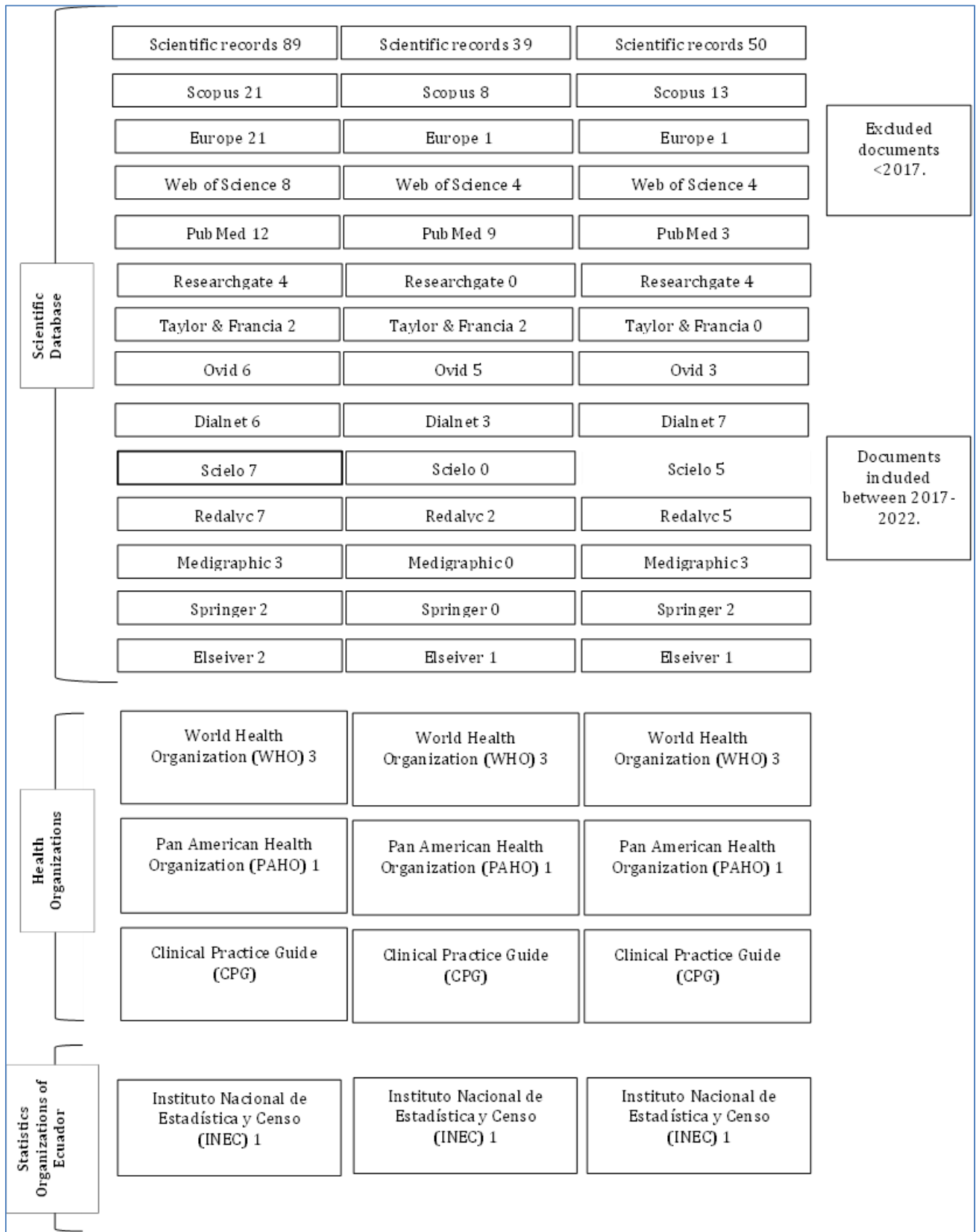


Figure 1 Flowchart descriptive review

For the selection of relevant articles, the topic of study was taken into consideration: Bacterial vaginosis in women of childbearing age in Latin America, whose inclusion criteria were: original articles and field studies that have been published from 2017 to 2022, in three languages: Spanish, English and Portuguese, which responded to the five research questions. Likewise, the exclusion criteria included theses, monographs, editorials, articles published outside the established time and that did not respond to the research questions.

On the other hand, the initial search yielded a total of 89 scientific articles from which 50 field studies were chosen to answer the research questions and 5 literature reviews used in the introduction; also, 6 documents from health organizations such as the World Health Organization (WHO), Pan American Health Organization (PAHO),

Clinical Practice Guide (CPG) and a document from the National Institute of Statistics and Census (INEC) were considered.

3. Results

Of the 61 papers potentially chosen, 50 scientific articles were used in the results to answer the research questions: in the first question about the prevalence of bacterial vaginosis in women in Latin America, 15 articles were used, about the risk factors 17, regarding the complications of bacterial vaginosis 12 answered, with reference to the therapeutic approach 10 scientific papers were chosen, and finally, in nursing interventions 22 articles were chosen.

3.1. Prevalence of bacterial vaginosis in women of childbearing age in Latin America

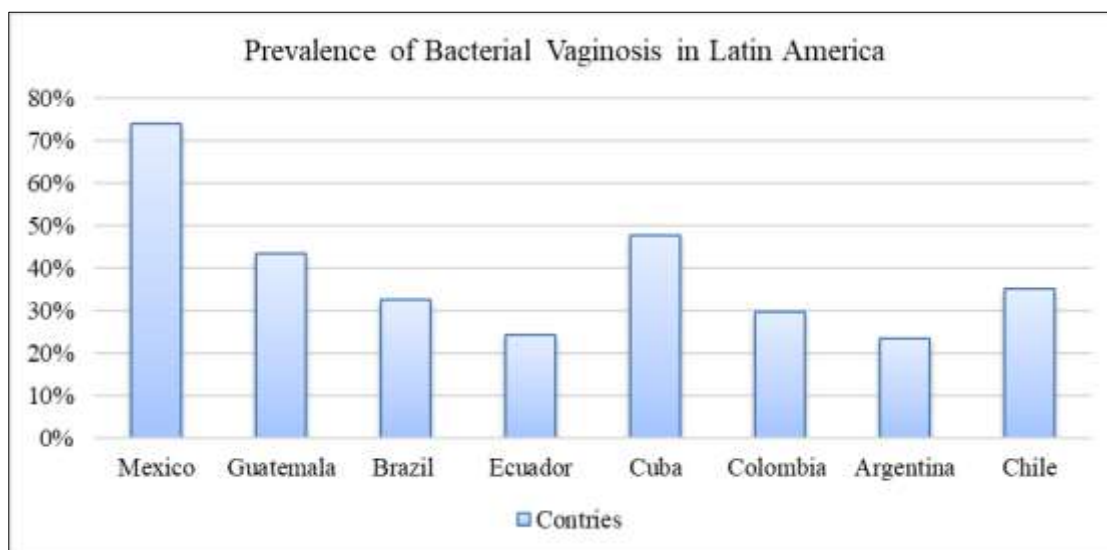


Figure 2 Prevalence of Bacterial Vaginosis in Latin America

In Mexico, a study was conducted on the prevalence of bacterial vaginosis in women between 15 and 44 years of age, in which different diagnostic tests such as Asmel and Nugent were applied, giving a frequency of 74% of BV [13]. Similarly, a study carried out in Guatemala mentions that the potassium hydroxide (KOH) test was applied for the diagnosis of BV, with a result of 43.4%. Likewise, in Chile, a prevalence of 35.2% is indicated and only this percentage was confirmed with vaginal microbiota laboratory tests [19]. In the aforementioned articles it can be observed that the prevalence is high when the Asmel and Nugent methods are used, in contrast to Guatemala and Chile that use (KOH) and vaginal microbiota tests, where the frequency is low, therefore, it can be indicated that depending on the diagnostic method for BV, the prevalence varies considerably.

In Brazil, a prevalence of 32.5% of BV was found [20]; other studies claim that reinfection of this disease can occur due to misapplication or abandonment of treatment [21, 22]. Similarly, in Ecuador, a study was conducted indicating that 24.2% of women were diagnosed with BV and 16.8% had a reinfection of this pathology [23, 7]. Studies conducted in Brazil and Ecuador found a similarity in the prevalence of bacterial vaginosis since reinfection of this pathology would be one of the main reasons why the frequency is high.

Regarding Cuba, a study on vaginal infections in women aged 15-44 years showed that 47.9% were bacterial vaginosis, followed by trichomoniasis and candidiasis, and it should be noted that 82.2% of the women investigated showed symptoms [24]. Similarly, in Colombia, a percentage of 29.9% of bacterial vaginosis is reported in a young adult population aged 18 to 40 years. It is important to emphasize that, during the investigation, a percentage of 9.4 % of BV was identified in older adults [25]. The aforementioned articles agree with the literature, which mentions that women of childbearing age or young adults had a higher prevalence of BV.

In relation to Argentina, a percentage of 21.36 % of women diagnosed with bacterial vaginosis was found, this study clarifies that this pathology is not a sexually transmitted disease, however, it can be caused by multiple external factors [26]. Another study conducted in the same country mentions that BV is more prevalent in women with HPV (Human Papillomavirus) 16 (high risk); in addition, it was found that Gardnerella Vaginalis is one of the main bacteria present in the vaginal flora of women who have STIs [27]. Although, several researches indicate that BV is not defined by WHO as a Sexually Transmitted Infection (STI) or Sexually Transmitted Disease (STD), however, some studies describe that this disease is related to HPV 16 and 18 which are the causative agents with risk for cervical cancer.

3.2. Risk factors for the development of bacterial vaginosis

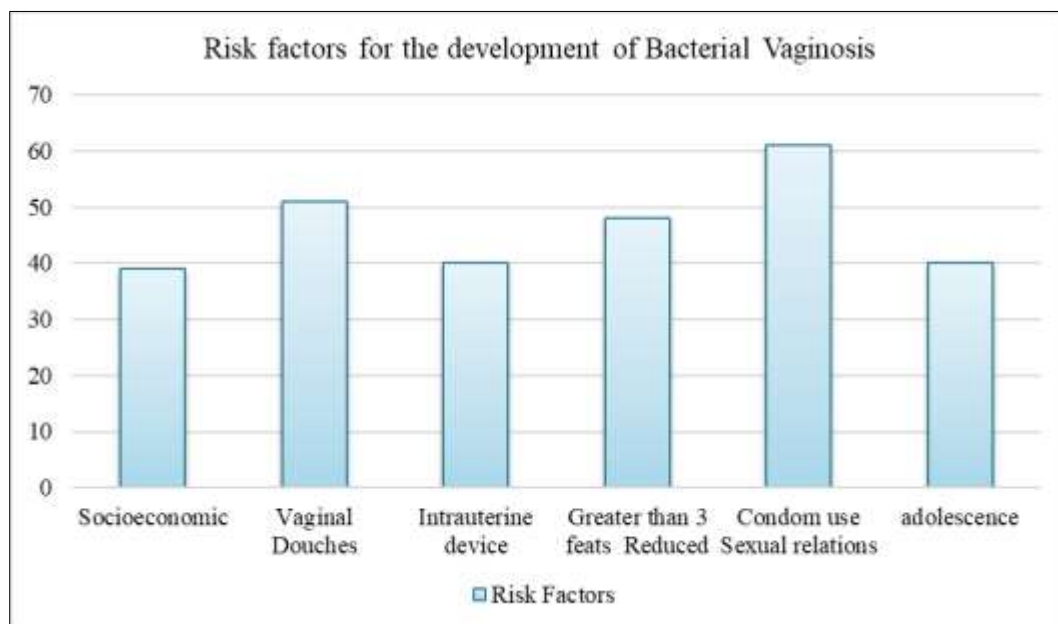


Figure 3 Risk Factors in Bacterial Vaginosis

In Colombia, a study was conducted by Mónica Chávez et al. [28] which indicates that the prevalence of BV is related to low socioeconomic status 18.5%. On the contrary, another study conducted in Guatemala indicates that there is no significant relationship between BV and socio-demographic status 40.90% [18]; this last research coincides with that of Valencia Arredondo et al. [25], however, it states that 35% of women who have had more than 3 pregnancies have presented BV. Likewise, Sánchez José Antonio et al [29] conducted a study in which BV was more frequent in patients with more than 3 pregnancies. Through the analysis of the articles [25, 19], a similarity can be observed regarding the occurrence of BV and the number of pregnancies; on the other hand, in two studies [28, 18], socioeconomic status does not have sufficient evidence to be related to the development of BV.

In a study conducted by Rafael Santos et al. [30] Cuba, he mentions that BV is diagnosed more frequently in young adult women and the main risk factor in this research is poor or inadequate hygiene performed by women in their intimate area 76.92%, in the same way, Marconi Camila et al. [31] in their article indicate that vaginal douching 42.90% have a significant relationship with BV. The studies cited above agree that one of the factors that promotes the development of bacterial vaginosis is vaginal douching and the cleaning techniques applied in the intimate area.

On the other hand, several studies [32, 33, 23, 34] agree that the reduced use of condoms during sexual intercourse is a triggering factor for BV, and it should be noted that in Ecuador and Colombia the percentages were as high as 63.8% and 45.5% respectively. In addition, Pedro Moregola et al [20] mentioned that the intrauterine device (IUD) is also a predisposing factor related to BV 72.7%. With respect to the aforementioned articles, they agree that the non-use of

condoms is a risk factor for the transmission of various vaginal infections; also, the IUD is an element of danger for the development of BV.

Along the same lines, in Cuba, Villafuerte Reinante et al. [35] found that sexual activity at an early age was associated with BV and the development of various complications such as cervicitis 23.9%. The same case is presented in Colombia, in women who have had sex since adolescence 19.8% and have more than four sexual partners 20.4% have presented BV [36]. However, in Mexico it is mentioned that this pathology occurs more frequently in patients with HIV [37]. On the other hand, in Brazil, women from the LGBTIQ+ community 36% have presented BV, due to the high possibility of transmission of this pathology through vaginal discharge [22]. The cited articles agree that the risk factors were early sexual intercourse, the number of sexual partners, women with HIV and the LGBTIQ+ community for contracting BV.

In addition to the above, in Brazil, two studies were conducted by Marconi Camila et al. [20] and Pedro Moregola et al. [31] who reported that tobacco use is associated with the development of BV 22% and 14.3%; these studies coincide with that conducted by Ana Salazar et al. [9] in which she identified that the use of drugs such as cannabis and intravaginal practices are risk factors for the development of BV because the use of agents harmful to health such as tobacco or drugs produces the appearance of cervico-vaginal cellular atypia, which cause alterations in physiology, such as pH, vaginal microbiota or vaginal discharge.

3.3. Complications of bacterial vaginosis

Complications of bacterial vaginosis can occur in both pregnant and non-pregnant women; thus, in the case of Colombia, a study by Chávez Vivas et al [28] mentioned that women diagnosed with BV have a higher risk of developing Pelvic Inflammatory Disease (PID) with $p = 0.000$. However, a study conducted in Argentina indicates that the vaginal microbiota of women with primary infertility was significantly related to the bacteria *Gardnerella vaginalis* and *Mycoplasma hominis*, with a p value < 0.0001 [38]. Other studies carried out in Australia also coincide with those of Argentina, mentioning that *Gardnerella vaginalis* was more prevalent in women diagnosed with infertility, with a p -value = 0.044 [39].

On the other hand, Seña Arlene et al [40] mention that the presence of bacterial vaginosis increases the risk of infection of Human Papillomavirus and *Trichomonas vaginalis* $p \leq 0.007$. On the contrary, a study elaborated in Mexico by Pablo Romero et al [41] mention that there is not a sufficient association with HPV, however, in Argentina it was mentioned that women with HPV 16 presented bacterial vaginosis 54.2% with a p value = 0.054 [27]. In the articles [40, 27] they point out similarities in the presence of BV in women with HPV, making them more vulnerable to acquire STIs, PID and infertility. On the other hand, Gómez Lucila et al [42], conducted an investigation in women between 35 and 37 weeks of gestation, who presented bacterial vaginosis 8.0%, who did not present any symptoms. Similarly, in Venezuela, Mercedes Rosa et al [43] indicated that BV is considered a risk factor in pregnancy, since it has been shown to be related to premature births with a value of $p = 0.036$. In contrast, in Ecuador, Sánchez María et al [44] mentioned that BV is related to complications of threatened abortion in 4.38%. After analyzing the studies, the authors agree that in pregnancy the complications of BV are premature delivery and threatened abortion, representing a gynecological-obstetric risk.

Also, it is important to mention that BV can present complications at the end of pregnancy, since two investigations conducted in Argentina by Silvina Cocucci et al [45] and Agustina Grosso et al [46] collected umbilical cord blood samples in newborns and maternal vaginal microbiota and showed that it was directly related to BV. [46] collected umbilical cord blood samples from newborns and from the mother's vaginal microbiota and showed that it was directly related to BV; in addition, they showed that there was premature rupture of membranes, causing preterm delivery, APGAR < 7 , low birth weight and neonatal damage, with a p -value = 0.002. On the contrary, in another research, in Brazil by Gkp Cunha et al [47], they indicate that BV occurred in women who had preterm delivery, however, no significant value was found to refer that these variables are related.

Therapeutic approach to bacterial vaginosis in women of childbearing age.

Table 3 Complications of bacterial vaginosis Prepared by: Authors

Drug	Dose	Effectiveness
Metronidazole	1 gram - 7 days	85%
Itraconazole + Secnidazole	33.3mg + 166.6mg	85%
Tinidazole	2 grams -2 days	84,20%
Fluconazole +Secnidazole	75 mg +1gr -10 days	98.38%
Vancomycin	Absence of data	89%

In Brazil, a study by Carlina Sanita et al. [21] evaluated the vaginal microbiota of women before and after treatment with metronidazole 1 gram oral for 7 days, the result showed that 67.4% suppressed BV ($p=0.001$), while 32.6% still persisted infection; this study shows great similarity with another study by Peebles Kathryn et al. [10] in which it is mentioned that metronidazole has offered a total recovery time of 4 weeks in 85% of patients, it is worth mentioning that 58% present a reinfection within one year, therefore, the prevalence of bacterial vaginosis is high and affects economically worldwide, because about 4800 million dollars are invested in the cure of this pathology.

On the other hand, in Venezuela, a study was carried out in four different cities in which treatment was applied with Itraconazole 33.3 mg plus Secnidazole 166.6 mg orally; prior to the application of the treatment, women presented dyspareunia, itching, burning and dysuria; after the therapeutic approach, the symptoms improved; after the treatment, patients presented a recovery of 85% [48]; similarly, in Colombia, Fluconazole plus Secnidazole was used, which had an efficacy of 98.38% [49]; however, Muñoz Alison et al [50], mention that combined treatments (Itraconazole plus Secnidazole) improve symptomatology, but produce a reduction in the concentration of antibiotics; on the contrary, when a single drug is administered, an improvement in the clinical cure rate is obtained.

Another study conducted in Venezuela by José Núñez [51] indicates that treatment with Tinidazole is effective for bacterial vaginosis, with a dosage of 2 grams for two days, presenting a recovery of 84.2% with a value of $p<0.0001$, however, a new study conducted in Ecuador mentions that Vancomycin is the drug that presents 89% effectiveness for BV [32]; it is worth mentioning that there are other treatments such as intravaginal antiseptic gel that is applied for 5-10 days ($p=0.030$), as well as the use of probiotics in case of reinfection [52, 53]. The analysis of the studies indicates that there are different types of drugs that can be used for the treatment of BV.

With reference to pregnant women, there is not much research in Latin American countries indicating an alternative treatment for bacterial vaginosis; however, it was found that Reboucas karinne et al [54] conducted a study in which they mentioned that metronidazole does not reduce the complications produced by BV, such as premature delivery

3.4. Nursing interventions for bacterial vaginosis

Bacterial vaginosis is one of the leading causes of morbidity in women, due to the complications that may arise; in a study conducted by Debby Ramirez et al. [11] in Guatemala, they mention that health personnel must offer timely diagnosis and treatment, considering that the nursing staff is the one who educates the patient; however, the inadequate therapeutic approach by the user is reflected in a high prevalence of bacterial vaginosis and gynecological-obstetric complications. Other studies are similar to the aforementioned research and refer to the need to strengthen health services, especially in prevention, promotion and pharmacological treatment, which has not yet been definitively established for this pathology, but there are alternatives already mentioned [10, 34].

Karina Merchán et al. [7], Ecuador and Marleivis Alonso et al. (55)Cuba indicate that primary health care (PHC) is the axis for reducing the prevalence of bacterial vaginosis, since PHC offers comprehensive and early care with the support of physicians, nurses, laboratorians, among others, who offer timely diagnosis and treatment to improve the health of the community, thus avoiding the self-medication of patients or reinfection of BV, including the gynecological difficulties that this can develop [24]. Similarly, another study by Marcelo Occhionero et al [26] mentioned that there is a need to improve the Ministerial Norms regarding the prevention and control of BV, which should have a standardized diagnostic method for women of childbearing age and thus avoid the prevalence and recurrence of this disease. From the aforementioned, it can be observed that the studies conducted show a similarity in terms of the need to improve the health system with respect to BV.

However, nursing interventions in bacterial vaginosis are directed towards health promotion and prevention, since, in a study conducted by Ignacio Olivera et al. [22], in Brazil, mentioned that to prevent BV it is necessary to strengthen sexual and reproductive education; in the same way, other articles indicate that the important risk factors for the development of this pathology are sexual relations at an early age, multiple sexual partners, non-use of condoms, IUD insertion, which with an educational intervention by nursing personnel could reduce the prevalence of BV [9, 51, 56, 57, 58]. Likewise, in another study conducted in Brazil by Pedro Moregola et al [20], health personnel prevention of bacterial vaginosis.

The responsible for identifying women who have a risk profile for the development of BV, since this would help to reduce the prevalence. After the analysis of the articles, it is observed that there is a similarity in terms of the intervention of nursing personnel with respect to the promotion. On the other hand, in nursing, diagnoses are developed according to the type of pathology; however, bacterial vaginosis is not included in the NANDA taxonomy; nevertheless, a care plan is offered according to the patient's needs. Several Latin American studies report that the intervention of health personnel should be directed towards the promotion and prevention of this pathology, as is the case in Peru, where it is indicated that inadequate hygiene practices such as the use of bactericidal soaps, vaginal douching and the lack of daily change of underwear is a trigger for the development of BV [4, 5, 31, 32, 59].

On the other hand, several authors agree that, teaching self-care by health personnel are techniques that help to prevent and decrease the prevalence of vaginal infections such as bacterial vaginosis [60, 33].

4. Conclusion

In conclusion, bacterial vaginosis is an infection that generally occurs in women of childbearing age and its prevalence in Latin American countries is high, with percentages as high as 74% in Mexico, followed by Cuba and Guatemala. Although the method for diagnosing BV is not standardized, the Asmel and Nugget tests, observation of fresh vaginal microbiota and the KOH test are available.

In terms of risk factors, the use of contraceptive methods such as IUDs, non-use of condoms and inadequate intimate hygiene are elements that generate a greater likelihood of developing bacterial vaginosis, in addition, it is worth mentioning that women who have had more than three pregnancies, HIV+ patients and those who belong to the LGBTIQ+ community, could suffer from BV.

Regarding the complications of bacterial vaginosis, they are the cause of gynecological-obstetric alterations such as PID and infertility, since BV alters the vaginal flora and, therefore, the physiology of the vagina, preventing the fertilization process; on the other hand, in pregnant women, complications derive in premature births and neonatal damage, even causing an APGAR < 7 points in the newborn in the first minute of life.

With respect to the therapeutic approach, it is generally based on the administration of Metronidazole, which has shown great effectiveness and tolerance, as well as Vancomycin and Fluconazole + Secnidazole, the latter being a combined therapy. It is important to mention that these drugs are only for women who present symptoms and are not pregnant.

Finally, nursing interventions are directed towards the promotion and prevention of BV, which helps to counteract the aforementioned pathology, even though there is no care plan within the NANDA Taxonomy.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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