

## Gingival Manifestations in Pregnant Patients and How they Affect the Psychology in the Third Trimester of Pregnancy

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Received: 13- June -2023

Revised: 18- July -2023

Accepted: 10- August -2023

### ABSTRACT

During pregnancy, it is common for pregnant women to present gingival manifestations, especially in the third trimester, due to hormonal factors, the increase in progesterone causes dilation of the capillaries of the mucosa, hyperemia and edema. The objective of the study was to determine the gingival manifestations that affect pregnant patients during the third trimester. A bibliographic review was carried out where the results of the analysis of the fifteen selected articles that were related to the theme were described. The main digital platforms such as Scielo and Pubmed were used. Among the main results, it was found that pregnant women can present mild to severe gingivitis, due to the accumulation of bacterial plaque, because during pregnancy, oral hygiene is inadequate in many women due to the nausea and vomiting they present, which makes them neglect their oral health. It was also found that late treatment causes gingival manifestations to evolve towards damage to the root cement, periodontal ligament and alveolar bone, hence the importance of promotion and prevention by the dentist. It was concluded that the main gingival manifestations presented by pregnant women are mucosal lesions that include mild to severe gingivitis; periodontal pathologies, especially chronic periodontitis, determined by hormonal changes in women during pregnancy and inadequate oral hygiene.

**Key words:** Pregnancy, Gestation, Gingival Manifestations.

### INTRODUCTION

Figuro et al. (1) consider pregnancy as "a condition in which the woman finds herself during a period of nine months, from fertilization, the formation of the zygote until the moment of delivery". This stage is characterized by multiple morphofunctional changes in the organ systems of the pregnant woman such as: endocrine, cardiovascular, pulmonary, gastrointestinal, among others, which allow adaptation to the new condition that allows adequate embryogenesis, growth and development of the new being.

Alfaro et al. (2) also consider that pregnancy is a stage in which physical and psychological changes occur, hence the importance of receiving comprehensive medical care periodically. The physiological mechanisms of normal pregnancy guarantee adjustments to the demands that the development of the new organism represents. This transformation occurs gradually, but continuously, during the 40 weeks of pregnancy and have a multifactorial condition, depend on the woman and her state of physical, nutritional, mental and social health (3).

The stress that constitutes pregnancy and the metabolic increase that occurs are a consequence of the metabolic effects of hormones (3). Hyper-functioning of the hypothalamic-pituitary-target organ axis determined by placental secretion of gonadotropin hormone-releasing hormone (GnRH) occurs, the pituitary gland suffers hypertrophy and hyperplasia at the expense of prolactin-producing cells, in addition, a state of physiological hypercortisism occurs, due to the placental production of ACTH and CRH that increase cortisol production. Elevated estrogens stimulate hepatic synthesis of thyroxine binding globulin (T4) and triiodothyronine (T3) because total serum thyroid hormone levels increase; however, its free fraction remains unchanged. Pregnancy is associated with a relative deficiency of iodine due to the active transport of iodine through the fetoplacental barrier, as well as its greater urinary excretion, so the contributions must be greater to meet the requirements. On the other hand, estrogen and progesterone levels are increased, whose effects have an impact on oral health. During pregnancy, oral health is affected by alterations of the oral flora, the condition of the mother and the changes that occur at this stage, and a group of oral lesions may appear that affect maternal-fetal health. The tooth, as well as

its supporting tissues, the buccal mucosa, are structures subject to injury during this period. On the other hand, systemic diseases often aggravate the underlying condition. The increase in caries in pregnant women is multifactorial: decrease in defensive factors such as changes in the composition of saliva, oral ecosystem, reflux vomiting, poor oral hygiene, changes in dietary and hormonal habits. Gingivitis and gingival hyperplasia are caused by high levels of circulating estrogen, together with gingival irritation due to the presence of abundant bacterial plaque. Pyogenic granulomas occur from 1% to 5% in pregnant women, angiogenesis, caused by sex hormones, and gingival irritation are predisposing factors. Tooth mobility is likely due to changes in the hard lamina, changes in the insertion apparatus, or underlying pathology. Enamel erosion is caused by repeated vomiting or hyperemesis gravidarum. Salivary changes such as reduced flow, decrease in sodium concentration and pH, an increase in potassium, protein and estrogen levels can be observed (4).

Gingival manifestations are mucocutaneous disorders that are discovered as inflammations, ulcers, blisters, erosions, among others, these lesions appear as a result of exposure to bacterial plaque; Hence the importance of maintaining proper oral hygiene, which reduces gum disease (5). These manifestations usually arise in the second month of pregnancy, if there is no follow-up and timely treatment, it intensifies throughout pregnancy. The incidence of this affectation can occur between 30% and 100% of pregnant women (6).

The increase in progesterone stimulates the dilation of gingival capillaries, increases permeability and gingival transudation, estrogens modify the keratinization of the gingival epithelium, causing degenerations and alterations of epithelial cells, resulting in inflammation of the gums, and predisposition to colonization and proliferation of microorganisms (6). Gingival recovery is a spontaneous healing process that occurs when pregnancy has ended and if other factors are not manifested that stop normal recovery, finally after one year after delivery a total recovery can be observed (7).

The most common gingival manifestations that occur in pregnancy are: gingivitis gravidarum, pyogenic granuloma of pregnancy, periodontal disease, dental caries (8).

Nápoles et al. (9) promote the dental prevention of the pregnant woman and attribute vital importance to it to control gum alterations, especially gingivitis, which is characterized by inflammation and bleeding, it should be noted that pregnancy in itself is not the cause of this or other oral pathologies, but it can complicate them due to hormonal changes. Gingivitis in some cases is identified by edema, hyperemia that manifests itself of reddish or bluish coloration, which bleeds during brushing or chewing, painless (10), gingival tissue abnormalities are related to bacterial plaque, dental calculi due to poor oral hygiene, which aggravates the clinical picture of gingivitis (11).

During pregnancy, lifestyle changes usually occur, such as decreased brushing due to the presence of nausea, which causes dental plaque sediments, the reflux of gastric acids erodes the enamel surface considerably affecting the teeth (12).

The gingival manifestations in pregnancy also depend on the nutrition of the mother before conception, as well as the school level and the knowledge that pregnant women have of the state of health as well as healthy eating habits and oral hygiene before planning their pregnancy, these factors influence the prevention of oral diseases in their condition. (6) Corchuelo et al. (13), in their research mentions that there are still habits, beliefs and attitudes of women in relation to oral health and this depends a lot on socioeconomic and cultural conditions.

In this sense, the dental professional plays an important role in the care of pregnant women, and for this they must know the physiological changes that women suffer at this stage, as well as the effects of medication and food, to apply them through protocols and dental plans for the promotion and prevention of oral health of pregnant women because they constitute a vulnerable group (14).

The main objective of this review was to determine the gingival manifestations that affect pregnant patients in the third trimester of gestation, a line of research aimed at the adequate management of manifestations and systematic diseases in relation to Dentistry.

## Materials and methods

### Modality of the research

For the present research work, a search for information was carried out from different bibliographic sources that theoretically supported the main gingival manifestations that occur in pregnancy, taking into account gestational age.

### Scope of the research

The scope of the review was descriptive where the facts were detailed, the works that addressed the research topic, the main causes of gingival manifestations in pregnant women were analyzed and identified for the development of the review. The methods of analysis and synthesis, inductive-deductive with a systemic approach were applied, which allowed to state the possible causes of the development of gingival diseases in pregnant women of the third trimester of pregnancy. The techniques applied were documentary analysis which allowed to collect relevant information from bibliographic sources such as: books, book chapters, articles of scientific journals, case studies, quantitative research, essays among others, in the different digital platforms in relation to the conceptual framework of the selected topic of the last 5 years using search engines.

### Results

We found 275 studies related to the keywords used and selected 15 scientific articles focused directly on the gingival manifestations of pregnant women, which showed the following results:

**Table 1: Information on reviewed articles**

N°	AUTHOR AND YEAR	ITEM TYPE	METHODOLOGY	SAMPLE	WEEKS OF GESTATI	RESULTS
1	Ruiz et al. (2018) (15)	Scientist	Observational, descriptive, cross-sectional	36 pregnant women	Third trimester	41% of pregnant women had periodontal disease in the third trimester, which presented poor oral hygiene.
2	Zambrano (2019) (16)	Scientist	Observational, descriptive	122 pregnant women	28 weeks of gestation	It was evidenced that 29% of pregnant women had gingivitis in their third trimester, 11% periodontitis moderate chronic and 7%
3	Hechevarria et al. (2020) (17)	Scientist	Descriptive - Transversal	47 pregnant women	28 weeks of gestation	It was evidenced that 66.6% of pregnant women who were in the third trimester of gestation presented mild gingival inflammation and 16.7% moderate to severe.
4	Vaca et al. (2022) (18)	Literature review	Systematic review	31 items	Third trimester	It was evidenced that the levels of the protein C-Reactive are higher when periodontal disease worsens, where 35% of pregnant women have moderate

5	Carrillo et al. (2019) (19)	Literature review	Systematic review	88 items	28 weeks gestation	45% of the articles state that in the 3rd trimester of pregnancy gingival inflammation increases due to the accumulation of bacterial plaque.
6	Ramirez et al. (2021) (20)	Literature review	Literature review	15 items	Third trimester	Among the articles found, 60% state that the increase in gingival inflammation intensifies in the 8th gestational month with greater risks of periodontitis and preeclampsia in pregnancy.
7	Tamayo et al. (2021) (21)	Scientist	Comparative experimental	34 pregnant women	Less than 32 weeks gestation	52.9% of pregnant women presented mild gingival alterations, with the presence of mild sacred, mostly at 28 gestational weeks.
8	Cuyo et al. (2019) (3)	Literature review	Literature review	17 scientific articles	24 to 36 weeks gestation	70% of pregnant women had gingival infections especially in the second trimester of pregnancy, causing damage to the root cement, periodontal ligament and alveolar bone.
9	Quispe (2019) (22)	Scientist	Explanatory-Descriptive	107pregnant women	28 weeks gestation	It was shown that pregnant women who are in the 3rd trimester of pregnancy manifested 48.6% of gingivitis.
10	Mayán et al. (2020) (23)	Scientist	Observational –Cross-sectional descriptive	78 pregnant women	Third trimester	Pregnant women who presented chronic gingivitis were 52.6% of whom 2.6% were in the third trimester of pregnancy
11	García et al. (2016) (24)	Literature review	Literature review	35 items	28 weeks gestation	82% of pregnant women presented gingival inflammations during the first and third trimester of pregnancy due to the presence of bacteria and microorganisms derived from the accumulated

12	Garcia et al. (2016) (25)	Scientist	Transversal - analytical	88 pregnant women	38 weeks gestation.	72% of pregnant women presented moderate gingivitis during the second trimester of pregnancy, due to poor oral hygiene.
13	Huaman (2017) (26)	Scientist	Observational, descriptive and cross-sectional	58 pregnant women	28 weeks gestation	It is noteworthy that 58% of pregnant women between the 3rd trimester presented mild gingivitis, while 31% presented moderate gingivitis caused by poor oral hygiene
14	Asmat (2018) (27)	Scientist	Descriptive	60 pregnant women	28 weeks gestation	88% of pregnant women presented moderate gingivitis in 43% in the third trimester of gestation due to the accumulation of bacterial plaque in the teeth.
15	Uscachi (2016) (28)	Scientist	Descriptive - Transversal	148 pregnant women	28 weeks	100% of pregnant women presented severe gingivitis in 51.4%, followed by moderate gingivitis with 43.2% in the third trimester of pregnancy as a result of poor oral hygiene.

Source: Author 2022

### Discussion

Through a literature review conducted in Lima, it has been determined that of 17 scientific articles, in 90% of them it was found that at least 70% of pregnant women who develop some periodontal or gingival diseases, presented a gestational age of approximately 28 weeks or during the second trimester of pregnancy, due to hormonal alterations, allowing the development of pathogenic microorganisms that trigger gingival pathologies (3).

García et al. (24) in their research, showed that of 35 scientific articles, in 79.5% of them it was identified that about 82% of women in gestational state tend to develop gingival problems during the first to third trimester of pregnancy, due to the hormonal changes experienced by women, giving way to bacterial development and the proliferation of microorganisms derived from bacterial plaque accumulated by poor oral hygiene.

Within an investigation carried out by Ramírez et al (20) through a literary review of 15 scientific articles, it was highlighted that pregnancy is directly related to the development of gingival and periodontal diseases, increasing by 75% the chances of developing this type of pathologies during the second and eighth month of gestation. which in turn influences the appearance of preeclampsia in pregnant women.

In a study conducted in Cusco, which included a population of 148 pregnant women who were subjected to a technique of direct clinical observation by dental professionals, determining that 51.4% of them presented severe gingivitis; while 43.2% showed moderate gingivitis and 5.4% presented mild gingivitis during the third trimester of pregnancy, identifying that the main cause of the condition is poor oral hygiene, producing the accumulation of dental bacterial plaque (28).

Likewise, Zambrano (16) in his study mentions that there is a high prevalence of gingivitis in pregnant women who, when not treated properly, there is a risk of developing other systemic diseases and presenting complications in pregnancy such as a preterm delivery or the newborn may have a low birth weight; specifying that this high prevalence is due to poor oral hygiene, occurred by poor technique or the time spent brushing teeth.

Asmat (27) in his inquiry introduced 60 pregnant women, who were subjected to the application of the modified gingival index of Lobene, evaluating that 88% of the women presented gingival problems during the first to the third trimester of gestation, of which at least 43% developed severe gingivitis, with the presence of bleeding to the touch, inflammation of the gums, redness, bad mouth breath, among others; highlighting that the main cause was derived from hormonal changes that trigger bacterial proliferation and therefore the development of gingival diseases.

In this regard, Vaca (18) in his systematic review found that female hormones contribute significantly to the development of gingival manifestations, in which he found that of 19 patients studied who presented gingivitis and periodontitis, 78% had a high level of C-reactive protein, highlighting that a high degree of C-reactive protein is an indicator of worsening periodontal disease.

On the other hand, Huamán (26) in its research section in which 58 pregnant women who were subjected to a dental clinical review, for data collection through the gingival index of Loe, it was obtained that 31% presented moderate gingivitis during the first and third gestational trimester, with inflammatory symptoms, redness of the gum, light bleeding before toothbrushing or flossing, pain, among others.

In a section made in Cuba in which a population of 78 pregnant women was inserted, it was found that, after a dental clinical examination, it was obtained that 56.1% of pregnant women during their first trimester of pregnancy, presented a picture of mild gingivitis, due to several factors, among which poor oral hygiene stands out. accumulation of bacterial plaque, smoking problems and even additional pathologies such as diabetes mellitus (23).

Tamayo et al. (21) in their research introduced 34 pregnant women with an approximate gestational age of 28 weeks and older; which when subjected to a clinical dental diagnostic evaluation showed that 52.9% presented mild gingivitis; However, 5% presented periodontal diseases due to the increase in the level of estrogen and progesterone, influencing the appearance of intense inflammations in the gums, as well as vascular permeability and exudation, generating microcirculatory ecstasy, helping in the filtration of liquids within the perivascular tissues, which finally causes the appearance of these dental conditions.

In a study focused on determining the periodontal manifestations of pregnant women in Cuba, the insertion of 47 pregnant women with periodontal alterations measured through the Russell periodontal index is established, obtaining that 95.7% of these women presented chronic periodontitis during the third trimester of gestation, due to hormonal or sexual factors of pregnancy. influencing the pathogenesis of this type of dental diseases (17).

In a research section carried out in Acapulco, in which 88 pregnant women participated, it was possible to identify after a direct oral evaluation that 72% presented periodontal and gingival problems, which included bleeding, mild to chronic inflammation, bad breath and intense redness; However, it was found that in most cases this condition was not derived from the accumulation of bacterial plaque or poor dental hygiene, but from hormonal alterations, typical of the gestational period (25).

## **Conclusions**

Through the theoretical foundation of the research, key conceptualizations were identified that support the issue raised, among which have been included pregnancy, alterations in pregnancy; gingival manifestations, their main etiology, characterizations, forms of prevention, the role played by the dental professional in these cases, among others.

On the other hand, from the bibliographic review it was identified that most pregnant women have presented gingival or periodontal manifestations during their gestational stage, especially during the second to third

trimester of pregnancy approximately; presenting as main causes the lack of oral hygiene, the accumulation of bacterial plaque, as well as hormonal alterations.

Finally, it is highlighted that the main gingival manifestations presented by a pregnant woman are gingival inflammations that include mild, moderate, and even chronic gingivitis; as well as periodontal pathologies that integrate especially chronic periodontitis, due to the same hormonal changes that women suffer during pregnancy and poor oral hygiene.

## References

1. Figuero Ruiz E, Prieto Prieto I, Bascones Martínez A. Hormonal changes associated with pregnancy. Gingive-periodontal involvement. *Advances in Periodontics and Oral Implantology*. [Online].; 2006 [accessed 2 November 2021]; 18(2):101-113. Available from:  
[https://scielo.isciii.es/scielo.php?script=sci\\_arttext&pid=S1699-65852006000200005](https://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1699-65852006000200005).
2. Alfaro Alfaro A, Castejón Navas I, Magán Sánchez R, Alfaro Alfaro MJ. Pregnancy and oral health. *Clinical Journal of Family Medicine*. [Online].; 2018 [accessed 2 November 2021]; 11(3): 144-153.. Available in: [https://scielo.isciii.es/scielo.php?pid=S1699-695X2018000300144&script=sci\\_arttext&tlng=pt](https://scielo.isciii.es/scielo.php?pid=S1699-695X2018000300144&script=sci_arttext&tlng=pt).
3. Carrillo-Mora Paul, García-Franco Alma, Soto-Lara María, Rodríguez-Vásquez Gonzalo, Pérez-Villalobos Johendi, Martínez-Torres Daniela. Physiological changes during normal pregnancy. *Rev. Fac. Med. (Mex.)* [magazine on the Internet]. 2021 Feb [cited 2022 Oct 29] ; 64( 1 ): 39-48. Available in: [http://www.scielo.org.mx/scielo.php?script=sci\\_arttext&pid=S0026-17422021000100039&lng=es](http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0026-17422021000100039&lng=es). Epub 06-Jul-2021. <https://doi.org/10.22201/fm.24484865e.2021.64.1.07>.
4. Sánchez Montero Darai, Montero Padrón Zoraida, Pons López Yahima. Characterization of oral health in pregnant women in Area II of the municipality of Cienfuegos. *Medisur* [Internet]. October 2017 [cited 30 October 2022]; 15(5): 629-639. Available in: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S1727-897X2017000500008&lng=es](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1727-897X2017000500008&lng=es).
5. Cuyo R, Flores Culqui S, Quinto Benalcázar R. Periodontal disease associated with pregnancy. *Scientific Dental Journal*. [Online].; 2019 [accessed July 27, 2022]; 7(1): 132-139.. Available from: <file:///C:/Users/USUARIO/Downloads/496-Texto%20del%20art%C3%ADculo-1620-1-10-20190701.pdf>.
6. Díaz Valdés L, Valle Lizama RL. The influence of mouth health in the future newborn during pregnancy. *Spirituan Medical Gazette*. [Online].; 2015 [accessed 4 November 2021]; 17(1):1-14.. Available in: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S1608-89212015000100012](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1608-89212015000100012).
7. Chávez Fernández M, Díaz del Mazo L, Santos Toledo L, Urgellés Y, Lafita Y. Clinical and epidemiological aspects in pregnant women with gingival disease. *MESAN Magazine*. [Online].; 2017 [accessed 4 November 2021]; 21(12):6081- 6092.. Available in: <https://www.redalyc.org/pdf/3684/368454498009.pdf>.
8. Yllesca Yllesca I, Manrique Chávez JE, Chávez Reátegui BDC. Epidemiological characteristics of periodontal disease and oral hygiene in pregnant and breastfeeding women. [Online].; 2015 [accessed 4 November 2021]; 25(4): 255-261.. Available in: [http://www.scielo.org.pe/scielo.php?pid=S1019-43552015000400002&script=sci\\_abstract&tlng=pt](http://www.scielo.org.pe/scielo.php?pid=S1019-43552015000400002&script=sci_abstract&tlng=pt).
9. Naples Pastoriza D, Soto López IB, Vizcay Hierrezuelom NL. Periodontal health status of pregnant women. *Magazine April 16*. [Online].; 2018 [accessed 20 September 2021]; 57(267):13-19.. Available in: <https://www.medigraphic.com/pdfs/abril/abr-2018/abr18267d.pdf>.
10. Marrero Fente A, López Cruz E, Castells Zayas Bazán S, Agüero Díaz A. Oral health and pregnancy. *Medical Archive Magazine of Camagüey*. [Online].; 2003 [accessed 5 November 2021]; 7(5):1-8.. Available in: <http://www.revistaamc.sld.cu/index.php/amc/article/view/3217>.
11. Palacios Sánchez B, Cerero Lapiedra R, Campo Trapero J. Gingival alterations not related to plaque. *RCOE*. [Online].; 2006 [accessed 6 November 2021]; 11(1):43-55.. Available in: <https://scielo.isciii.es/pdf/rcoe/v11n1/puesta.pdf>.
12. Méndez Báez MG, Pérez Bejarano NM. Characteristics of periodontal status in pregnant women. *Sanmarquina Dentistry*. [Online].; 2021 [accessed 6 November 2021];21(3): 165-172. Available in: <https://doi.org/10.15381/os.v21i3.15147>.
13. Corchuelo Ojeda J, Soto Llanos L, Villavicencio J. Situation of caries, gingivitis and oral hygiene in pregnant and non-pregnant women. [Online].; 2016 [accessed 20 September 2021]; 19(1): 67-74.. Available at: <http://www.scielo.org.co/pdf/reus/v19n1/0124-7107-reus-19-01-00067.pdf>.

15. Martínez Moreno AD. Index of gingival inflammation in pregnant women. [Online]. Ocotal, Nueva Segovia, Nicaragua: Universidad Nacional Autónoma de Nicaragua-. Center for Health Research and Studies. School of Public Health; 2013 [cited 20 September 2021]. Available in:
16. <https://repositorio.unan.edu.ni/7657/1/t769.pdf>.
17. Ruiz Candina HJ, Herrera Batista AJ, Padrón Fonte ET. Periodontal disease in pregnant women in the first and third trimesters of pregnancy. Cuban Journal of Biomedical Research. [Online].; 2018 [accessed 2 November 2021]; 37(2):18-26.. Available in: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S0864-03002018000200003](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-03002018000200003).
18. Zambrano Solines AE. Periodontal status in pregnant women in Enrique Sotomayor gynecological-obstetric hospital. Guayaquil. Journal of Medicine FCM-UCSG. [Online].; 2019[accessed July 19, 2022]; 23(1): 5-10.. Available in: <https://dialnet.unirioja.es/servlet/articulo?codigo=8289635>.
19. Hecheverría B, Ruiz L, Núñez L, Pérez Pérez Y, Pons Hecheverría L. Periodontal manifestations in pregnant women of the Maternal Home "Wilma Espín" of the polyclinic 30 de Noviembre. KIRU Magazine. [Online].; 2020 [accessed July 19, 2022]; 17(3):123-128.. Available in: <https://doi.org/10.24265/kiru.2020.v17n3.02>.
20. Vaca Altamirano GL, Sánchez Granja PF, Vaca Zambrano SE. Neutral statistical analysis on pregnancy and its implications in periodontal disease. Journal Latin American Association of Neutrosophic Sciences. [Online].; 2022 [accessed July 19, 2022]; 20(1): 63-74.. Available in: <http://fs.unm.edu/NCML2/index.php/112/article/view/191>.
21. Carrillo de Albornoz A, Herrero A, Rioboo M, Santa Cruz I, Campo I. Oral health in pregnant women. Spanish Society of Periodontology and Osseointegration. [Online].; 2019[accessed July 20, 2022]: 1-32. Available at:
22. [https://www.sepa.es/web\\_update/wp-content/uploads/2019/05/Informe\\_SaludBucal\\_Embazarada-16.07.32.pdf](https://www.sepa.es/web_update/wp-content/uploads/2019/05/Informe_SaludBucal_Embazarada-16.07.32.pdf).
23. Ramírez Rodríguez M, Polanco Arias M. Prevention of gingival diseases in pregnant women as a social need. Revista Ciencias Básica Biomédicas in Granma Manzanillo. [Online].; 2021[accessed July 20, 2022]: 1-15. Available from: <https://cibamanz2021.sld.cu/index.php/cibamanz/cibamanz2021/paper/viewFile/662/431>.
24. Tamayo Ávila Y, P, Páez González Y, de Peralta Hijuelos MG. Educational intervention on periodontal disease in pregnant women. Revista Correo Científico Médico. [Online].; 2021 [accessed July 27, 2022]; 25(4): 1-10.. Available in: <http://www.revcoemed.sld.cu/index.php/coemed/article/view/4038/2016>.
25. Quispe Cama M. Prevalence of gingivitis in pregnant mothers during the gestation period at the Madre Niño Teaching Hospital "San Bartolomé" of Lima-2018. [Online]. Lima: Universidad Peruana de los Andes; 2019[accessed July 20, 2022]. Available from:
26. <https://repositorio.upla.edu.pe/bitstream/handle/20.500.12848/1332/TESIS%20FINA%20L.pdf?sequence=1&isAllowed=y>.
27. Mayán Reina G, Henríquez Rodríguez M, Parejo Maden D, Morales Morán L, Rodríguez R. Chronic gingivitis in pregnant women. Teaching Stomatological Clinics Siboney Playa 2018-2019. Journal International Congress Stomatologies 2020. [Online].; 2020[accessed July 20, 2022]: 1-11. Available in: <http://estomatologia2020.sld.cu/index.php/estomatologia/2020/paper/view/275/51>.
28. García Y, Rosado A, García M, García M, Pérez R, Bascones A. Periodontal disease and adverse pregnancy outcomes; Literature review. Part II. Advances Periodontics Magazine. [Online].; 2016 [accessed July 27, 2022]; 28(3):137-145.. Available in: <https://scielo.isciii.es/pdf/peri/v28n3/original3.pdf>.
29. García Morales G, Vega Vega S, Tolentino Alvarado A. Prevalence of periodontal disease in pregnant women in a family medicine unit in Acapulco, Guerrero. Family Care Magazine. [Online].; 2016 [accessed July 27 July 2022]; 23(3):75-79. Available in: <https://reader.elsevier.com/reader/sd/pii/S1405887116301286?token=CF4D30755D774DC7FF752BEC6488F6A16C62633D91A3F2FC306D84ECA9E2CE867BEE7EC74DC7FF752BEC6488F6A16C62633D91A3F2FC306D84ECA9E2CE867BEE7EC74DC7FF752BEC6488F6A16C62633D91A3F2FC306D84ECA9E2CE867BEE7EC74DC7FF752BEC6488F6A16C62633D91A3F2FC306D84ECA9E2CE867BEE7EC>
30. Huamán Culqui R. Prevalence of gingivitis in pregnant women attended at the Virgen de Fátima regional hospital, Chachapoyas - 2017. [Online]. Chachapoyas: Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas; 2017[accessed July 20, 2022].. Available in:



<https://repositorio.untrm.edu.pe/bitstream/handle/20.500.14077/1161/INFORME%20FINAL%20REYNA%20HUAMAN%20CULQUI.pdf?sequence=1&isAllowed=y>.

31. Asmat Mejía C. Frequency of gingivitis in pregnant women attending the regional hospital "Eleazar Guzmán Barrón" in a new Chimbote in the period 2017 (April - July)". [Online]. Chimbote: Catholic University of Los Angeles Chimbote; 2018[accessed July 20, 2022]. Available from:
32. [http://repositorio.uladech.edu.pe/bitstream/handle/20.500.13032/5195/FRECUENCIA GINGIVITIS ASMAT MEJIA CARLA NICOLE.pdf?sequence=1](http://repositorio.uladech.edu.pe/bitstream/handle/20.500.13032/5195/FRECUENCIA%20GINGIVITIS%20ASMAT%20MEJIA%20CARLA%20NICOLE.pdf?sequence=1).
33. De Dios Uscachi Quispe AJ. Prevalence of gingivitis in pregnant women attended at the Quiquijana health center, 2016. [Online]. Cusco: National University of San Antonio Abad of Cusco; 2016[accessed July 20, 2022]. Available from:
34. <https://repositorio.unsaac.edu.pe/bitstream/handle/20.500.12918/1946/253T20170514.pdf?sequence=1&isAllowed=y>.