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Motivational Intervention to Modify Knowledge about Periodontal Disease Prevention in Pregnant Women

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Abstract

BACKGROUND: Currently, periodontal disease during pregnancy is associated with gestational diabetes, low birth weight, and pre-term birth.

AIM: The aim of this study was to determine the difference in the level of knowledge about periodontal disease prevention, before and after applying a motivational educational intervention in pregnant women at a primary health-care center.

METHODS: Quasi-experimental study in 180 pregnant women from a health center, during the period September to December 2022. The data collection technique was a questionnaire survey with satisfactory characteristics of validity and reliability. An educational intervention with a motivational approach was developed, which was validated in a pre-liminary pilot test. The Wilcoxon statistical test was used to compare knowledge before and after the intervention, and the Chi-square test to assess the association between variables.

RESULTS: The age and educational level that pre-dominated were 21–30 years and complete secondary school, respectively. A significant difference was found between the level of knowledge before and after in pregnant women ($p < 0.001$). There was no association between the level of knowledge about periodontal disease prevention with age and educational level in pregnant women at the health center, before and after a motivational intervention ($p > 0.05$).

CONCLUSION: The motivational educational intervention managed to significantly improve the level of knowledge in pregnant women about the prevention of periodontal disease; however, it was not associated with age and educational level.

Introduction

The gestational stage is characterized by a series of hormonal alterations that condition various physiological and immunological variations in women. The oral cavity is also affected by these variations that can contribute to the development of periodontal disease in pregnant women [1], [2]. Periodontal disease, which includes periodontitis and gingivitis, is a multifactorial infectious pathology with immunoinflammatory mechanisms that cause inflamed gum tissue, periodontal ligament, alveolar bone, and cement [3]. Worldwide, it has been identified in more than 30% of people from various communities and the prevalence on pregnant women represents between 5% and 20% [1], [3]. There is evidence that has associated periodontal disease with gestational diabetes, low birth weight, pre-eclampsia, miscarriage, and childbirth pre-mature [3], [4].

These unfavorable outcomes for pregnant women together with the fact that future mothers have a fundamental role in learning healthy habits for their children from early age, have meant that the education of pregnant women is a primary objective of public health programs [3]. However, improving the knowledge of pregnant women still remains a challenge, due in part to the lack of interest of pregnant women in the prevention of oral diseases [2], [4]. In this sense, the challenge of improving oral health within primary care during antenatal checkups is a pending task in public health policies [5], [6], [7].

There is evidence to affirm that education and motivation strategies regarding correct oral hygiene habits can help maintain good oral health in future mothers and their infants [1], [2], [3]. This can be achieved through motivational educational interventions that have been shown to be effective on topics such as oral health, diet, and exercise [8], [9], [10]. Compared to a traditional technique, the interview motivational suggests an intervention where learning is focused on identifying and remove barriers that prevent behavior modification and encourage the participant to reflect on

changes that could be made from their own perspective to improve self-efficacy. When self-efficacy is improved, the chances of behavioral changes increase [11], [12].

Therefore, the purpose of the study was to determine the difference in the level of knowledge about periodontal disease prevention, before and after applying an educational intervention with a motivational approach in pregnant women from a primary health-care center.

Methods

A quasi-experimental design study was carried out in a study population made up of 180 pregnant women from the "José Leonardo Ortiz" primary health care center, located in the province of Chiclayo, Peru; who participated in a motivational educational intervention from September to December 2022. Pregnant women of legal age, registered in antenatal care at the health center, and at any stage of gestational age were included in the study. Pregnant women with some previous training or orientation on the subject, with any physical or mental condition that make their participation difficult, or who refused the invitation to participate were excluded from the study. Pregnant women who did not complete their participation in the educational intervention were withdrawn from the research.

A questionnaire was developed to measure the level of knowledge about the prevention of periodontal disease aimed at pregnant women, which consists of 12 closed questions with multiple alternatives and a single answer that generates values of high (9–12 points), intermediate (4–8 points), and low (0–3 points). The content validity of the questionnaire was obtained from the qualitative assessment provided by five judges specialized in the subject.

In a pilot study in 20 pregnant women, the reliability and temporal stability of the questionnaire were evaluated. The pregnant women who participated in the pilot study did not participate in the main study to avoid any type of information bias. The Kuder–Richardson test was used to assess reliability and obtain a high coefficient ($r = 0.84$). In a test–retest technique, the paired t-test was used to confirm the temporal stability of the questionnaire between measurements, with a non-significant variation ($p = 0.23$).

The collection of the pregnant women personal data was through the database provided by the health center. The participants were personally contacted during the antenatal checkups scheduled, to explain the purpose of the study and obtain a signed informed consent. In the case of non-attendance at antenatal checkups, they were contacted by telephone and an appointment was arranged at the health center.

A questionnaire (test) was applied to assess the level of baseline knowledge, before the intervention. Subsequently, sessions of educational activities with a motivational approach were carried out for 4 months and the questionnaire was applied again to the same participants (re-test). Likewise, other variables such as the age of the pregnant woman and educational level (before and after intervention) were evaluated.

An educational intervention was designed according to previous publications [12], [13]. The content of the educational intervention was validated by a periodontist, pediatric dentist, and educator with experience in motivational approaches. In a pilot study, the adaptation of the motivational intervention to the study population was carried out, as well as research team training. The activities began with a 30-min introductory session in groups of 10–12 participants, with the purpose of explaining the objectives of the intervention, sequence of sessions, and schedule of activities.

In the first education session, the research team explained the periodontal disease and its impact on pregnancy. Participants were asked about their initial concerns, information was provided about periodontal conditions that occur during pregnancy, and participants were encouraged to provide helpful ideas for managing these conditions. Appropriate ways to manage periodontal problems were explained and pregnant women described their current practices to prevent periodontal disease so that they themselves internalize the need to change habits. In the second session, they were asked to rate the following on two scales from 1 to 10: the importance of changing habits and self-confidence in reaching the goal set by themselves. The participants explored the possible barriers to modifying behavior and offered possible solutions or options for behavior change, supported by constant monitoring, and guidance by the research team.

Each participant and their answers were coded in an Excel database. The statistical analysis was performed using IBM SPSS® version 25. Univariate statistics were used to establish absolute and relative frequency distributions, and the Wilcoxon signed rank test to quantify the change before and after with a significance level of 5%. In addition, the Chi-square statistical test was used to find the association between the level of knowledge and covariates.

Results

The results show that 56.1% of the pregnant women were between 21 and 30 years of age, 26.7% <20 years of age, and 17.2% from 31 years of age or older. Regarding educational level, 49.4% had completed high school, 17.8% had incomplete

secondary, 16.7% completed higher education, 10% had incomplete higher education, and only 6.1% completed primary education.

Table 1 shows that there is a significant difference in the knowledge of pregnant women, before and after receiving the motivational intervention, to confirm that knowledge about prevention has improved or increased in pregnant women.

Table 1: Knowledge about periodontal disease prevention, before and after a motivational intervention in pregnant women

Knowledge	Mean	Standard deviation	Wilcoxon p-value
Before	6.63	1.76	0.001
After	11.08	0.86	

Table 2 shows that before the intervention, most of the pregnant women who had a low level of knowledge were under 20 years of age. Likewise, the majority who had an intermediate or high level of knowledge were between 21 and 30 years old. Using the non-parametric test, it can be affirmed that there was no statistically significant association between the level of knowledge of pregnant women and age.

Table 2: Association between the knowledge about periodontal disease prevention and age in pregnant women, before a motivational intervention

Age group (years)	Knowledge before intervention								Chi-square	
	Low		Intermediate		High		Total		Value	p-value
	f	%	f	%	f	%	F	%		
<20	5	55.6	38	25.5	5	22.7	48	26.7	4.907	0.297
21–30	4	44.4	84	56.4	13	59.1	101	56.1		
>31	0	0	27	18.1	4	18.2	31	17.2		
Total	9	100.0	149	100.0	22	100.0	180	100.0		

Table 3 shows that after the intervention, no pregnant woman presented a low level of knowledge. One pregnant woman had an intermediate level of knowledge, while the majority of pregnant women between 21 and 30 years old had a high level of knowledge. Using the non-parametric test, it can be affirmed that there was no statistically significant association between the level of knowledge of pregnant women and age.

Table 3: Association between the knowledge about periodontal disease prevention and age in pregnant women, after a motivational intervention

Age group (years)	Knowledge after intervention								Chi-square	
	Low		Intermediate		High		Total		Value	p-value
	f	%	f	%	F	%	F	%		
<20	0	0	0	0	48	26.8	48	26.7	0.787	0.675
21–30	0	0	1	100	100	55.9	101	56.1		
>31	0	0	0	0	31	17.3	31	17.2		
Total	0	0	1	100	179	100.0	180	100.0		

Table 4 shows that before the intervention, most of the pregnant women with low, intermediate, or high levels of knowledge had a complete secondary level. Using the non-parametric test, it can be affirmed that there was no statistically significant association between the level of knowledge of pregnant women and their educational level.

Table 5 shows that after the intervention, no pregnant woman obtained low knowledge. One pregnant woman with moderate knowledge had an incomplete higher education level. Most of the pregnant women with a high knowledge had complete secondary level. Using the non-parametric test, it can be affirmed that there was no statistically significant association between the level of knowledge and educational level.

Table 4: Association between the knowledge about periodontal disease prevention and educational level in pregnant women, before a motivational intervention

Educational level	Knowledge before intervention								Chi-square	
	Low		Intermediate		High		Total		Value	p-value
	f	%	f	%	F	%	f	%		
Completed primary	1	11.1	10	6.7	0	0	11	6.1	10.408	0.238
Completed secondary	5	55.6	75	50.3	9	40.9	89	49.4		
Not completed secondary	2	22.2	28	18.8	2	9.1	32	17.8		
Higher education	1	11.1	21	14.1	8	36.4	30	16.7		
Not completed higher education	0	0	15	10.1	3	13.6	18	10.0		
Total	9	100.0	149	100.0	22	100.0	180	100.0		

Table 5: Relationship of the knowledge about periodontal disease prevention with educational level in pregnant women, after a motivational intervention

Educational level	Knowledge after intervention								Chi-square	
	Low		Intermediate		High		Total		Value	p-value
	f	%	f	%	f	%	F	%		
Completed primary	0	0	0	0	11	6.1	11	6.1	9.050	0.060
Completed secondary	0	0	0	0	89	49.7	89	49.4		
Not completed secondary	0	0	0	0	32	17.9	32	17.8		
Higher education	0	0	0	0	30	16.8	30	16.7		
Not completed higher education	0	0	1	100	17	9.5	18	10.0		
Total	0	0	1	100	179	100.0	180	100.0		

Discussion

The publications with available data regarding beliefs, quality of life, knowledge, and oral hygiene of pregnant women show that the existence of documents related to plans, policies, and strategies in oral health do not guarantee a decrease in epidemiological indicators in this population group [14], [15], [16]. Thus, this research shows motivational interventions as a useful and practical tool at the level of primary care in perinatal health [8], [12], [17].

The results obtained in the present investigation indicated that it was successful in achieving the main objective with respect to improving knowledge about periodontal disease prevention. The change in knowledge can be explained from the perception reported by the pregnant women themselves of participating in educational activities and recognizing oral health education as a useful strategy to address the deficiencies of the comprehensive health-care model for pregnant women [18]. The results are confirmed with the findings of other studies that show an improvement of the percentage values in the level of knowledge [10], [19], [20]. This includes a study that reports an affective-participatory approach, similar to the present study [19], and another study that agrees with

establishing a statistically significant improvement [10]. These similarities can be understood because innovative interventions have left the traditional model to focus on the self-management of the participants to respond to their own needs according to their condition, even in small groups [12], [13].

It is also evident that both the educational level and age of pregnant women were not related to the knowledge about the prevention of periodontal disease, before intervention and neither after. In the characteristics, pregnant women with an age between 21 and 30 years and a complete secondary educational level pre-dominate, through all levels of knowledge for the prevention of periodontal disease. Previous studies in other countries have reported a higher frequency of pregnant women with medium and higher technical educational levels, in addition to using a dichotomous category to assess knowledge. Likewise, the pregnant women in the investigations were cared for in care centers with greater coverage, such as a polyclinic and a hospital [10], [20]. Other studies have shown a slightly variable similarity with respect to the age range in pregnant women with sufficient or insufficient knowledge, especially toward the second decade of life [10], [19], [20]. This can be explained due to the influence exerted by cultural variations on pregnant women who access health services at different levels of care, in addition to confirming the frequency of pregnant women in the third decade of life regardless of geographic location [21], [22].

As strengths of the present investigation are the acceptance of the intervention program to recruit and maintain a number of participants for a very specific topic such as the prevention of periodontal disease, where other investigations report less participation at the end of the intervention [10], [19], [20]. The results obtained demonstrate the advantages that a motivational approach can offer in the prevention of chronic diseases, not only in the final effect but also for the development of the intervention. Among the limitations, there is the non-randomization because it is a group formed in the health center before the start of this investigation, in addition to the lack of a control group. It should also be considered that the conclusions obtained are only valid for the study population with specific socioeconomic and cultural characteristics.

Conclusion

It is concluded that knowledge about the prevention of periodontal disease in pregnant women increased significantly after an educational intervention based on motivational interview sessions with a total duration of 4 months. It was also verified that the knowledge before or after the intervention was independent of the age and educational level of the pregnant woman.

References

1. Ruiz-Candina H, Herrera-Batista A, Padrón-Fonte E. Disease periodontal in pregnant women of the first and third trimester of pregnancy. Rev Cubana Inv Biomed. 2019;37(2):1-9.
2. Lee YL, Hu HY, Chou SY, Lin CL, Cheng FS, Yu CY, *et al*. Periodontal disease and preterm delivery: A nationwide population-based cohort study of Taiwan. Sci Rep. 2022;12(1):3297. https://doi.org/10.1038/s41598-022-07425-8
   PMid:35228672
3. Cuya RC, Flores SC, Quinto RB. Periodontal disease associated with pregnancy. Rev Cient Odontol. 2019;7(1):132-9. https://doi.org/10.21142/2523-2754-0701-2019-132-139
4. Fischer RG, Lira R Jr., Retamal-Valdes B, Figueiredo LC, Malheiros Z, Stewart B, *et al*. Periodontal disease and its impact on general health in Latin America. Section V: Treatment of periodontitis. Braz Oral Res. 2020;34(Supp 11):e026. https://doi.org/10.1590/1807-3107bor-2020.vol34.0026
   PMid:32294679
5. Salih Y, Nasr AM, Ahmed AB, Sharif ME, Adam I. Prevalence of and risk factors for periodontal disease among pregnant women in an antenatal care clinic in Khartoum, Sudan. BMC Res Notes. 2020;13(1):147. https://doi.org/10.1186/s13104-020-04998-3
   PMid:32160921
6. Vite-Bustos P, Ramirez-Vera K, Gomez-Tolentino A, San Martin-Lopez A, Ojeda-Betancourt C, Vera-Pedroza A. Prevalence of gingivitis in pregnant patients attending to the bicentenary health center of Tihuatlán, Ver. Rev Mex Med Forense. 2019;4(Suppl 1):48-50.
7. Balaji VC, Saraswathi K, Manikandan S. Periodontal heath in first trimester of pregnancy and birth weight outcomes. Indian J Dent Res. 2021;32(2):181-6. https://doi.org/10.4103/ijdr.ijdr_94_21
   PMid:34810386
8. Ramírez-Trujillo MÁ, Villanueva-Vilchis MC, Gaitán-Cepeda LA, Aguilar-Díaz FC, Rojas-Russell ME, Fuente-Hernández J. Impact of a maternal motivational interviewing on oral health in the mother-child dyad. Healthcare (Basel). 2022;10(6):1044. https://doi.org/10.3390/healthcare10061044
   PMid:35742095
9. Rosales HC, Suárez RS, Peña RV, Roblejo MB. Intervention educational to modify knowledge about chronic gingivitis in adolescents. Rev Cie Synapse. 2019;14(1):1-18.
10. Tamayo-Avila Y, Páez-González Y, Grave-de-Peralta-Hijuelos M. Educational intervention on disease periodontal in pregnant women. Mail Hundred Med. 2021;25(4):1-16.
11. Pattanshetti K, Kothari HP, Tiwari J, Malagi S, Pattanashetty S, Hinge K. Assessment of knowledge and attitude of expectant mothers regarding effect of their oral health and its influence on the infant oral health. Int J Clin Pediatr Dent. 2020;13(5):471-5. https://doi.org/10.5005/jp-journals-10005-1817
    PMid:33623331
12. Saffari M, Sanaeinasab H, Mobini M, Sepandi M, Rashidi-Jahan H, Sehlo MG, *et al*. Effect of a health-education program using motivational interviewing on oral health behavior and self-efficacy in pregnant women: A randomized controlled trial. Eur J Oral Sci. 2020;128(4):308-16. https://doi.org/10.1111/eos.12704
    PMid:32618034
13. Miller WR, Rollnick S. Ten things that motivational interviewing

is not. Behav Cogn Psychother. 2009;37(2):129-40. https://doi.org/10.1017/S1352465809005128

PMid:19364414

14. Ignacio G, Estrada G, Caroll L, Salazar O, Elma V, Flores R. Quality of life and oral health in pregnant women in an establishment of health of the province of Tacna. Rev Med Hosp Hipólito Unanue Tacna. 2023;15(2):20-4.
15. Asmat-Abanto A, Alvarado-Santillán G. Popular beliefs on the oral health of pregnant women treated in two hospitals Peruvians. Int J Odontostomatol. 2019;13(4):486-92. https://dx.doi.org/10.4067/S0718-381X2019000400486
16. Gerrero S, Tenorio Y. Level of knowledge of measurements preventive measures in the oral health of pregnant adolescents. Rev Odontol Basadrina. 2022;6(1):13-20. https://doi.org/10.4067/S0717-75262019000200103
17. Luna MC, Cubides AM, Ruiz CF, Alonso SV, Pinzón EM, Gullozo L. Association between low birth weight and preterm delivery in pregnant women with signs of periodontal disease attended in an institution of the primary level of health of the valley of the caucacolombia. Rev Chil Obstet Gynecology. 2019;84(2):103-11. https:// dx.doi.org/10.4067/S0717-75262019000200103
18. Adeniyi A, Donnelly L, Janssen P, Jevitt C, Kardeh B, von Bergmann H, et al. Pregnant women's perspectives on integrating preventive oral health in prenatal care. BMC Pregnancy Childbirth. 2021;21(1):271. https://dx.doi.org/10.1186/s12884-021-03750-4
19. Fraga EM, Garcia EM. Educational intervention on periodontal diseases in pregnant women. Estomatol Clinic Manuel Angle. 2015;54(260):13-24.
20. Samón R, Avilés C, Sánchez N, Berdión N, Thoma F. Actions Educational periodontal health in pregnant women. Rev Inf Scient. 2017;96(1):1-11.
21. Liu P, Wen W, Yu KF, Gao X, Lo EC, Wong MC. Effectiveness of a family-centered behavioral and educational counselling approach to improve periodontal health of pregnant women: A randomized controlled trial. BMC Oral Health. 2020;20(1):284. https://doi.org/10.1186/s12903-020-01265-6
22. Allen-Revoredo C, Ladera-Castañeda MI, Córdova-Limaylla NE, Briceño-Vergel G, Cervantes-Ganoza LA, Cayo-Rojas C. Knowledge, attitudes, and practices on oral health prevention associated with sociodemographic factors of adolescent students from a Peruvian-Swiss educational institution. J Int Oral Health. 2022;14(5):475.