

Taking Food Supplements Vary Prolactin Levels in Pregnant Women for the Promotion of Breastfeeding?

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Background

Pregnancy constitutes a period of numerous physical changes in the pregnant woman, but these changes are not the only ones that occur, there are also psychological and or emotional changes with great repercussions on the health of the pregnant woman, fetus, family and social life. All these changes lead women to experience fear in the face of ignorance of the healthy habits that they should carry out during pregnancy to ensure the optimal development of the newborn; above all, this fear is accentuated in pregnant primiparous women with no previous experience of pregnancy. One of the biggest concerns is the correct feeding during this period to later provide the newborn with optimal milk. Therefore, it is important that women have adequate prior knowledge of the acquisition of healthy habits to face this situation and promote healthy habits [1].

Breastfeeding is the ideal food for babies, its benefits for the health of mothers and babies are scientifically proven [2]. In addition, it constitutes a habit that since ancient times has been intimately rooted in the family and or cultural context, therefore, the meticulous study of the influence of the primary caregiver of the primiparous will be essential.

Human milk is the food of choice in the first 6 months of life for all kids, including premature kids, twins, and sick kids [3]. Thus, exclusive breastfeeding is recommended for up to six

months, introducing foods appropriate to the baby's age from this moment on, maintaining breastfeeding for up to two years or more, if the mother and child so wish [4,5]. In addition, the increase in the prevalence and duration of breastfeeding provides benefits for the entire society [6,7]. The assessment of the nutritional status of the pregnant woman is essential for the establishment of a successful breastfeeding [8,7]. Breastfeeding is the ideal food for newborns; its benefits for the health of mothers and children are scientifically proven.

The hormone responsible for milk maternal secretion is prolactin, produced by the pituitary gland; a pea-sized gland located at the base of the brain, which controls metabolism, growth, and sexual development. Although prolactin is produced in small amounts in both men and women who are not pregnant, its main function is to stimulate lactation (milk production) in women during pregnancy and to maintain milk supply during breastfeeding. The prolactin test measures the level of this hormone in the blood. Normal prolactin levels are 80 to 400 ng/ml [9]. In the case of a woman who is breastfeeding, the infant's demand for milk is actually the regulator of the mother's milk supply. When the baby sucks on the mother's breast, the woman's pituitary gland releases more prolactin into the bloodstream, increasing milk production [10]. If the mother does not breastfeed her baby, prolactin returns to normal levels once she gives birth [11,12].

Another of the analytical parameters related to the nutritional status of the pregnant woman is vitamin B12; optimal levels are extremely important in pregnancy [13,7]. Vitamin B12 is involved in vital processes such as the synthesis and maturation of red blood cells, DNA synthesis during cell division, maintenance of the nervous system, synthesis of neuronal lipids and neurotransmitters, synthesis of proteins and amino acids. In pregnancy and lactation, as expected, the needs are increased. Its normal values range from 200 to 900 pg/ml (picograms per milliliter) [14,7].

Another important nutritional parameter in pregnancy and lactation is folic acid (B9 Vitamin). During breastfeeding, the mother's folates may decrease due to their passage into breast milk, which is the best source of folic acid for the infant. Folic acid contributes to the normal psychological function of the newborn. Normal levels are 2.7 to 17.0 nanograms per milliliter (ng/ml).

To all this, another fundamental nutritional element in pregnant women is added, such as iron; iron contributes to the normal formation of red blood cells and hemoglobin [15,16]. Normal values for transferrin are 204 to 360 mg/dl. An adequate intake contributes to an optimal nutritional status during lactation [17].

Primiparous pregnant women do not breastfeed their children due to a lack of information on adequate nutrition during pregnancy to ensure the establishment of adequate lactation [18]. The Spanish Association of Pediatrics, in 2019, determined that 70.3% of pregnant women do not have an adequate diet, which may be the cause of the abandonment of breastfeeding [19].

The figure of the primary caregiver of primiparous [7,20] will be decisive for the adoption of healthy eating habits, support and care; therefore, its inclusion in health education programs is necessary to guarantee the success of breastfeeding [21]. Currently, in the current health programs aimed at pregnant women, they do not contemplate the figure of the caregiver.

Currently, educational intervention programs have been influenced by the situation of the covid-19 pandemic. The current situation of the covid-19 pandemic has had a considerable impact on pregnant women. The educational intervention methodology has changed to non-face-to-face consultation [22]. This fact makes health professionals, we have to safeguard these barriers to establish a successful Health Education.

Interventions for Health Education implementation framed in the situation of pandemic by Covid-19, are carried out considering a process that can be analyzed from several dimensions such as a communicative, social and educational intervention process in fact, it is framed as a basic health promotion strategy in the field of public health and social policies. Its objective could be affirmed that it consists of promoting a social change, through the promotion of breastfeeding, that makes pregnant women more adapted to their reality and can be more active in the health and disease processes that affect so much to them individually such as newborns, family and community therefore, health professionals must be endowed with communication skills.

Methods

Research question

The research question that guided this study was: Pregnant

women infected by covid-19 have lower prolactin values than non-infected pregnant and this fact influences the promotion of breastfeeding?

Study design

A prospective (cohort), cross-sectional and descriptive study was carried out, measuring the variable and design with intervention, this being quasi experimental, with independent data, where exposed and unexposed individuals are selected, to a factor (pregnant / main caregivers inclusion or not a Health Education) with intervention and pre and post measurement; and after delivery, the rate of breastfeeding is assessed.

Previously, existing hypotheses in today's society for the tendency to abandon breastfeeding were analyzed among them, the most incipient was the cultural context with the influence on the decision-making of breastfeeding their children related to feeding during pregnancy [23].

Epidemiological data were collected: medical record number (the identification of each patient has been collected based on a medical record number to respect patient confidentiality).

In addition, analytical parameters were evaluated in the pregnant woman during the first trimester of pregnancy and the third trimester, before and after the Health Intervention.

Description of random variables

Continuous quantitative variables: Prolactin levels.

Nominal qualitative variables: Covid infection, Health Education and breastfeeding rate.

Participants sample and recruitment

The research was carried out in a sample of primiparous pregnant and caregiver meeting the inclusion criteria.

The sample was obtained retrospectively by selecting all the medical records of primiparous pregnant women under the codification of the clinical process of normal pregnancy in the Medora computer registry [24,25]. From the year 2020 to 2021 and identification of each of them from their main caregiver; the study population was 209 of pregnant women in Health Area; with a sample size of 88 primiparous women.

Those patients who, after receiving the pertinent information, gave their consent to participate in the study were included. The individuals were divided into two samples; and each individual was only part of one group; that is, the study contains independent data; where the primiparous and caregivers are divided into two groups A with 44 pregnant women and B with another 44 pregnant women. For this, half of the sample were randomly selected to establish exposed and unexposed individuals to a factor [26,27]. In this case, the inclusion of the main caregiver in Health Education; to assess over time the degree of influence of Health Education on the caregiver in the correct feeding of the pregnant woman, promotion of breastfeeding and its rate. The intervention corresponded to the choice of the sample according to variables and the application of health education sessions with or without the inclusion of the main caregiver with subsequent analysis. The participants in the study were asked for the corresponding informed consent regarding the research project, guaranteeing ethical legality and data protection. The study was carried out in compliance with Organic Law 3/2018, of December 5, on the protection of personal data [28] and guarantee of digital rights.

Inclusion criteria

The inclusion criteria were: 1. Primiparous women who belonged to the Portillo Health Center (Valladolid, Spain) by territorial demarcation with a diagnosis of normal pregnancy registered in the clinical history; 2. women treated at the Portillo Health Center during the period from December 2020 to October 2021; and 3. primary caregiver identified by the pregnant woman during the pregnancy and puerperium process, able to give informed consent.

Exclusion criteria

The exclusion criteria were: 1. pregnant with no identified primary caregiver or referral; 2. primiparous women with a serious clinical situation, complicated or pathological pregnancy; 3. primiparous women with a diagnosis of coronavirus infection during pregnancy, three months before becoming pregnant or during breastfeeding (do not obtain interference in the analytical parameters); 4. and primiparous women in contact isolation situation or symptoms compatible with covid-19 infection without laboratory confirmation of infection.

Data collection

The data collection period was from December 2020 to October 2021. A group with eighty-eight participants from the Portillo Health Center, Valladolid, Spain, was conducted.

To collect the information, a database was developed with the purpose of organizing and storing information that came from the same context. The statistical analysis package was used: Spss.

The levels of prolactin, folic acid, transferrin, vitamin B12, responses to the pre-educational and post-educational questionnaires were recorded.

To begin accessing the clinical history, the Medora computer program was accessed, the following data were recorded: pregnancy diagnosis, health education activity according to its modality: individualized or group, with or without a caregiver, delivery date, diagnosis of puerperium and breastfeeding or not [28].

Intervention

The sample is divided into three groups with four previously planned stages of intervention (Figure 1).

The study is structured in the following four interventions for each of the groups:

First intervention: A session was held to present the project to the health team and request their collaboration [29]. He contacted the midwife of the Health Center and the study was presented, asked for their collaboration to select the sample and contact the pregnant women. Recruitment of the main caregiver. Collection of the sample after review of records in nominal and numerals in clinical processes of pregnancy in the computerized medical history program of Sacyl (Medora) under the due legal consent of the Primary Care Management of Valladolid, Spain, to be able to access the Clinical History for research purposes [28]. Contact with the pregnant woman and caregivers by telephone. Interview and explanation of the project. Once the patient agreed to participate in the study after the due informed consent, the first intervention was performed in the second trimester (13-26 weeks): Anthropometric parameters and blood parameters: Weight, size and analytics: Prolac-

tin, folic acid, transferrin and B12 vitamin levels.

Second intervention: Next, a double Health Education intervention was carried out, established in two sample groups (27-38 weeks of pregnancy) previously defined to later carry out a comparison; Health Education talks on breastfeeding were given to half of the sample (primiparous women), where the benefits for the mother, the baby and the family were indicated [30,31]. Technique and lactogenic foods; on the other hand, the other half of the sample received the same health education talks with the participation of their main caregiver during the last weeks of pregnancy; The two groups were compared with their level of knowledge before and after the educational intervention, that is, with a pre and post educational questionnaire respectively, called pre-educational and post-educational questionnaires, previously validated [32]. All of them were followed up until the first postpartum visit, both women who received Health Education with their caregivers and those who received it alone; the breastfeeding index was assessed.

Resources used: Xacta brand digital scale (precision 100 g). For hematology and biochemical determinations, blood was taken in a reference hospital laboratory (University Clinical Hospital, Valladolid, Spain). For the development of the study, the necessary material and human resources were counted on to carry it out, without interfering in the performance of other types of studies or in other tasks that nurses are usually entrusted with. The material resources used were Microsoft® Powe-point® presentations with projected videos. Due to the current health situation of the Covid-19 pandemic, Health Education was carried out virtually applying and respecting all health security measures.

For the design of the Health Education talks, a teaching program was carried out, taking into account the importance of the teacher's pedagogical capacity, the socialization of the experiences and the interactions of the group members, carrying out a group education program. Within this type of intervention, awareness-raising activities about determinants that influence health were also included, always from a broad and holistic perspective (social, political, environmental factors...) favoring the social participation of pregnant women [33,34].

An important aspect to remember is that, regardless of the type of intervention, it is the use of the teaching-learning process where the cognitive, affective-attitudinal and psychomotor spheres are worked [12,35]. Oral, gestural, visual and human support that was used to convey an idea, stimulate, motivate, and help change was emphasized [36,37]. In addition, coordination with the population in space, time, etc. and transmission of messages and training of capacities to achieve a reaction, a response, an impact. For the educational intervention study, a schedule was previously planned:

- Virtual presentation session of the program to pregnant women/main caregiver. The study to be carried out and the planning of the sessions (human and material resources) were explained. Informed consent.

Beginning of the health education talks

1st session: preparation of the pre-educational questionnaire [32, 11]. And staging of the statistical data / prevalence of breastfeeding at a global, national and regional level.

2nd session: presentation of the historical evolution of the habit of breastfeeding. Cultural and / or social context.

3rd session: benefits of breastfeeding for the baby, mother and family.

4th session: breastfeeding technique and duration.

5th session: adequate nutrition during pregnancy (lactogenic foods), and preparation of the post-educational questionnaire [32,38].

Third intervention: After carrying out the educational intervention and exposure of the sample to factor (Health Education), blood parameters were analyzed in the third trimester of pregnancy (38-40 weeks, once the Health Education had already been carried out). To make the comparison of the values once the Health Education has been carried out in the pregnant woman together with her main caregiver or without the participation of the latter; to finally assess the successful establishment of breastfeeding as exclusive feeding for your baby.

Fourth intervention: Finally, a postpartum woman was recruited once she was discharged from her home, to assess the establishment of breastfeeding and interpretation of the results after the intervention.

Results

Of the 88 primiparous pregnant women, who participated in the study, in the first trimester they registered an average weight of 63.99 ± 8.29 , (mean= 63.99 , $8.29 \pm SD$, median= 63.46%). Ordering the samples from highest to lowest, the range in which 50% of the central weight varies is 10.74 Kg (interquartile range). The pregnant woman with the lowest weight in the first trimester is 48.34 (minimum). 25% of the pregnant women who participated in the study had a mean weight of 58.06 (25th percentile). The pregnant woman with the highest registered weight is 87.68 Kg (maximum).

The mean height of the primiparous pregnancies in the first trimester was 165.06 ± 14.05 .

Descriptive analysis

At the time of data collection, the analytical parameters found according to before receiving health education were: The mean level of folic acid in the blood before receiving Health Education 6.13 ± 4.49 ng/ml; mean blood folic acid level after receiving Health Education 12.04 ± 7.03 ng/ml.

Among the other analytical parameters: The mean prolactin level in the blood before receiving health education, was similar to the results from folic acid, 63.83 ± 35.96 ng/ml and after receiving health education, the mean blood prolactin level is 196.08 ± 124.02 ng/ml. Regarding transferrin levels before receiving health education; the mean blood level is 190.15 ± 51.16 mg/dl and the mean transferrin level increases by 260.34 ± 67.58 mg/dl.

Interestingly, the mean level of B12 vitamin in blood before receiving health education 198.05 ± 60.73 pg/ml and mean blood level of B12 vitamin after receiving health education 332.81 ± 230.87 ng/ml.

Another of the variables studied, family history of breastfeeding, 67 (76.13%) pregnant women did have a family history and 21 (23.86%) did not. The results show that there is not a significant relationship between primiparous pregnant women who have a history of breastfeeding and breastfeeding rates ($p > 0.05$).

However, there is a significant difference between the rate of breastfeeding and the presence of the caregiver of the pregnant woman ($p < 0.05$).

The variable takes food supplements, 35 (39.77%) of the pregnant women did not take any supplements; while 53 (60.23%) did take some type of food supplement, there is a significant difference bivariate relationship breastfeeding and food complements ($p < 0.05$) (Table 1).

Multivariate analysis

Bivariate relationship between pregnant woman analytical parameters before and after receiving Health Education with family ground and the taking of food supplements.

Table 2 summarizes the analytical parameters before and after receiving health education with the taking of food supplements. According to the data obtained, there is no significant difference between the analytical parameters of folic acid, prolactin, transferrin and B12 vitamin with the taking of food supplements, neither before nor after receiving health education ($p > 0.05$).

There is also not significant difference in relation to the family ground with the parameters: folic acid, transferrin and B12 vitamin ($p > 0.05$). However, there is a significant difference between prolactin values before and after receiving Health Education ($p < 0.05$).

Bivariate relationship between pregnant woman analytical parameters before and after receiving health education with caregiver and breastfeeding.

Folic acid levels before health education was not statistically significant ($p < 0.05$).

Comparison of lactation index with Health Education participation of the caregiver ($p < 0.001$). It is concluded that the population percentage of pregnant women who breastfeed their babies and attend Health Education with their caregivers 42 ± 95.45 ($n=44$) is significantly different from that of pregnant women who do not participate in Health Education as their main caregiver 20 ± 45.45 (Table 2).

Table 2: Shows a conclusion of efficacy will be determined by a statistically significant effect at a level of 0.05 in the intervention coefficient, between the parameters of folic acid, prolactin, transferrin and B12 vitamin with women who are breastfeeding.

Related to Health Education and breastfeeding, the caregivers felt the duty to take care of the pregnant women in terms of eating habits and attending to their needs.

Building relationship between knowledge about breastfeeding and lactogenic foods before and after receiving Health Education.

Of the 88 primiparous pregnant women ($n=44$), 50% pregnant without caregiver had little knowledge (before receiving Health Education), about the benefits that breastfeeding has for the child, mother and society 17 (38.63%), while pregnant with caregivers 27 (61.36%) were aware of these benefits, with a significant increase in affirmative responses in the posteducational questionnaire 35 (79.54%); however, pregnant without caregiver after receiving Health Education, the result in the posteducational questionnaire was worrying, a small number of the sample had knowledge despite having received Health Education (Tables 3 and 4).

In relation to knowledge about lactogenic foods, only 3 (6.81%) knew any food; however, most of the pregnant with caregivers knew about this type of diet, the knowledge being higher after receiving Health Education.

Discussion

This study identifies how health education for pregnant women, including the caregiver, positively modifies the levels of folic acid, prolactin, transferrin and vitamin B12, and is related to the establishment of successful breastfeeding. The analytical parameters studied in the primiparous pregnant woman were dependent on health education, including the caregiver, confirming the need to introduce a specific health education program for the pregnant woman, including the main caregiver, as soon as possible in clinical practice.

In the study sample, it was observed that prolactin, folic acid, transferrin and B12 vitamin levels, were higher in the pregnant women who attended health education with a caregiver than in the pregnant women who attended alone, the prolactin parameters of women who attended the health education talks with their caregiver were 288.46 ± 107.56 ng/ml, while pregnant women who attended alone obtained prolactin values of 103.60 ± 45.47 ng/ml (N=44); the same occurs with the folic acid levels of pregnant women who attend with a caregiver, oscillating in the following analytical values 16.93 ± 4.08 ng/ml in reference to those who did not attend with a caregiver 7.16 ± 5.87 ng/ml, ($p < 0.05$).

A recent study confirms how the social relations of the pregnant woman are statistically significant in the correct feeding of the woman and the success of breastfeeding; this study aimed to summarize the existing research on the possible causes of the reduction in the incidence, exclusivity and duration of breastfeeding in obese women [39]. As a result, it was found that obese women demonstrated reduced confidence in their ability to achieve their own breastfeeding goals ($p < 0.0001$), these women had fewer close friends and relatives with previous breastfeeding experience ($p < 0.0001$); they also had less social influence to breastfeed ($p < 0.02$); in our study, women with a family history of breastfeeding had prolactin levels of 254 ± 140.06 ng/ml (N=21), while those with no history of prolactin ranged between 177.93 ± 113.69 ng/ml (N=21), $p < 0.05$.

However, the relationship between pregnant women who had a family history of breastfeeding and the establishment of breastfeeding was not statistically significant ($p > 0.05$), this data confirms that family history of breastfeeding is not a relevant piece of information to guarantee breastfeeding maternal in pregnant, that is, the health intervention of the "caregiver" element is necessary to increase the rates of breastfeeding, a study that we have carried out.

Another of the findings found in this study is the parallel increase in androgens, as the BMI increases in pregnant women, negatively influencing the start and duration of breastfeeding, in turn the start of lactogenesis II occurs late in women with altered feeding, therefore, it was concluded that obese women were associated with significantly lower rates of initiation, duration and exclusivity of breastfeeding.

In our study, there was a statistical difference between transferrin and B12 vitamin parameters in pregnant women with and without a caregiver; The pregnant women who attended the health education talks with a caregiver had transferrin analytical values of 296.81 ± 67.69 mg/dl compared to

the values of 223.86 ± 44.13 mg/dl of those who did not attend with a caregiver; the same data occurs with B12 vitamin levels, 505.04 ± 213.96 pg/ml for pregnant women with a caregiver compared to 160.59 ± 36.92 pg/ml for women without a caregiver.

The findings found confirm the influence of social relations in the diet of pregnant women; therefore, there is a significant difference between the rate of breastfeeding and the presence of the pregnant woman's caregiver in health education ($p < 0.05$), with social support being influential in promoting this health habit for mother, child, family and society.

Other research has shown that obese women have reduced basal prolactin levels in the first 48 h postpartum, and reduced suckling-induced prolactin release 2-7 days postpartum, which may reduce the rate of milk synthesis during pregnancy. this period [40]. In our study, the prolactin levels ($169.80 - 222.36$ ng/ml, N=44) of the pregnant women who attend the sessions on adequate nutrition for a correct establishment and duration of breastfeeding; are higher than women who did not attend the sessions had a lower blood prolactin value ($56.21 - 71.45$ ng/ml, N=44).

Furthermore, these investigations indicate that obesity during pregnancy (BMI ≥ 30.0) is associated with a short duration of breastfeeding; to this is added an increase of 0.7 kg of additional weight of the newborn during infancy.

The sample of pregnant women in our research, before attending the Health Education sessions, obtained prolactin values of $56.21 - 71.45$ ng/ml, while after attendance (38-40 weeks of gestation), the levels were $169.80 - 222.36$ ng/ml ($p < 0.05$); These results obtained are in line with the results of a study on the consumption of ultra-processed foods by pregnant women through an educational intervention with health professionals [41]. In said study, a non-random controlled educational intervention on healthy eating and physical activity during pregnancy in primary health care was carried out, the results of which were a quarter of the energy consumed by pregnant women provided from ultra-processed foods. The intervention reduced these percentages of energy between the first and second trimesters of pregnancy by 4.6 points ($p = 0.015$). This effect was not seen in the third trimester of pregnancy; this study concluded that the training of health professionals to promote healthy eating practices is a viable and sustainable alternative to reduce ultra-processed foods.

It is important to point out that according to the health promotion and prevention strategy of the National Health System (in Spain), the specific objective is to promote healthy lifestyles, defining the results of health promotion as measured and based processes. in health education. health, where health professionals must acquire skills [24]. Likewise, our study confirms the importance of Health Education in reference to the feeding of pregnant women to increase the rate of breastfeeding, but this health education is extended with an important and innovative element, the caregiver of the mother pregnant woman.

Through Health Education, patients obtain benefits that allow them to access health under normal conditions, develop their own abilities to face daily situations and be able to contribute to their community; they can also lead to lower health and social costs; for this, it is necessary to contribute to a more efficient allocation of the structure and resources of primary care [42,43].

A study with a quantitative approach [44]. Measurement of the variable and design with intervention, this being quasi-experimental with a sample of 102 pregnant women in the last weeks of childbirth from three different health centers, talks were held on health education on breastfeeding, by conducting both pre-educational and post-educational tests, the pre-tests applied to pregnant women yielded a percentage of 4.34 of affirmative responses, that is, they were almost completely unaware of all the issues related to breastfeeding, with 95.65% of the responses being negative. However, according to the statistical data obtained during the post test, 86.95% obtained affirmative results, that is, they had knowledge about breastfeeding.

Unlike this study, in our study, pregnant women without a caregiver after receiving Health Education, the result in the post-educational questionnaire on their knowledge of lactogenic foods was 1 ± 2.27 , compared to the result 3 ± 6 , 81 of the educational pre-questionnaires. Comparing with the findings found in our study, in relation to the knowledge of pregnant women about lactogenic foods, only 1(2.27%) of the pregnant women who attended health education talks without a caregiver, knew of any food of this type; however, 43(97.72%) of the pregnant women who attended with a caregiver had knowledge. To this was added the understanding of the healthy foods that should be eaten during pregnancy, 5(11.36%) of the pregnant women without a caregiver in Health Education and 39(88.63%) with a caregiver knew how to identify the correct foods.

A research study, carried out on controlled pregnant women in hospital outpatient clinics, concluded that educational support for mothers in relation to breastfeeding, whether it is carried out before or after delivery, improves the proportion of mothers that maintains breastfeeding at six months of life of the newborn [45]. A significantly higher percentage of mothers with exclusive breastfeeding was found in the group that received antenatal education at six weeks 1.04 ± 2.90 and at 3 months 1.07 ± 3.48 . In our study, the breastfeeding rate was 48% (N=88) after receiving Health Education; being 7% (N=44), in the pregnant women who attended the sessions without a caregiver, however, the women who attended with the caregiver, presented a breastfeeding rate of 41% (N=44).

Regarding the generalization of the results, this study advances in the knowledge of the degree of influence of the caregiver in the healthy eating habits of the pregnant woman to establish a successful breastfeeding, therefore, the need to restructure the current education programs is confirmed. for health in pregnant women, including the caregiver as an agent of active change.

Health professionals, as those responsible for health education, must take into account the active role of caregivers in pregnant women, in addition to knowing how they perceive pregnancy care; pregnancy is a stage of vulnerability in women; this period requires a more complex management or management, additional time, overload on the part of the caregiver... for this reason, we must provide comprehensive and integrated care to their caregivers [46,47].

The findings of this study indicate that a common and comprehensive Health Education Protocol must be programmed in the promotion of breastfeeding, this programming must include assistance to the caregiver of the pregnant woman, to be carried out by midwives and health personnel. Health professionals both urban and rural, that is, a common clinical guide for

standardized action throughout the Health System, for which it is essential that the Health Policy knows this evidence; always as a final objective the search of the improvement of the sanitary quality.

The covid-19 pandemic has undoubtedly brought with it greater affective, emotional and social vulnerability in pregnant women, but also in health professionals who work in pregnancy care services, a recent study shows the impact on the well-being of In the UK nursing and midwifery workforce during the first wave of the pandemic, a revised Impact of Events score ≥ 33 (probable post-traumatic stress disorder) was observed in 44.6%, 37.1% and 29.3% of participants [Couper K], all this has brought with it a change in the modality of Health Education, without the presence of a Pregnant-Health Professional; this has resulted in a greater influence of the person who provides care to the pregnant woman, therefore, the need to train this caregiver in adequate knowledge of lactogenic foods for the promotion of breastfeeding.

Limitations

The study has strengths and limitations. Strengths include a theoretically guide approach to inform activities and data collection for health promotion, a healthy habit for society, breastfeeding. The initial limitation found in the study was determined by the pandemic-covid19's situation, therefore the modality Health Education was carried out virtually to guarantee the safety of the patients at all times while maintaining the quality of the intervention. Other limitations include that findings were focused only on one health centers and not hospital, in addition to the importance of the figure of the main caregiver. A study including hospitals and carefully analyzes the figure of the main caregiver (mother, partner, age.) may have led to different findings.

Conclusion

The presence of the primiparous pregnant woman's primary caregiver in health education programs has important repercussions in promoting healthy habits (adequate feeding of the pregnant woman) to establish successful breastfeeding.

The Covid-19 pandemic has highlighted the multiple deficiencies and inequality of the different health systems and education, as well as the need for resources adapted to the situation: from the usefulness of computers and internet connection required to carry out online Health Education, to the added emotional and interpersonal support during confinement, this aspect is even more influential in the situation of emotional vulnerability that the primiparous pregnant woman finds herself, accentuating with the emotional burden experienced by the pandemic; thus giving special importance to the presence of the caregiver in the health education of the primipara for the promotion of breastfeeding.

Finally, it should be noted that, in view of the results obtained in this study, the need for the implementation in health centers of a specific health education program for pregnant women, including the caregiver, is evidenced, under the prism of comprehensive health strategies; carrying out effective interventions in terms of correct feeding of the pregnant woman, aimed at promoting breastfeeding. These programs, implemented by multidisciplinary teams, can help improve the quality of life of pregnant women, newborns and society.

The proposed intervention will improve the quality of life of women, children and society; in addition to reducing the cost of healthcare.

What is already known

- Human milk is the food of choice in the first 6 months of life for all children, including premature babies, twins, and sick children. Therefore, exclusive breastfeeding is recommended for up to six months.
- The figure of the main caregiver influences pregnant women regarding the care and Health Promotion of healthy habits.
- The situation of the Covid-19 pandemic has increased the vulnerability of the primiparous pregnant woman, especially on an emotional level, added to this is the change in health education interventions.

What this paper adds

- The high level of correlation between the inclusion of the primary caregiver of the primiparous pregnant woman in maternal education programs and an adequate feeding of the pregnant woman.
- The effectiveness of the health education of the primary caregiver of primiparous women in increasing the rates of women breastfeeding their children.
- The need to include the primary caregiver of the primiparous pregnant woman in Health Education programs to promote breastfeeding, most in need in the Covid-19 pandemic situation. Nursing practice with Health Education activities in the caregiver of the pregnant woman can contribute to improving breastfeeding rates, as well as reducing maternal and infant pathologies, reducing health expenditure.

Declarations

Ethical approval/ informed consent: Ethical approval was obtained from University Clinical Hospital, Valladolid, Spain (Health Bioethics Committee). All participants provided voluntary, written informed consent. Focus group participants

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Data availability: Due to the sensitive nature of the data obtained in this study, participants were assured raw data would remain confidential and would not be shared.

Conflict interest: The authors declare that they have no known competing financial interests or personal relationship that could have appeared to influence the work reported in this paper.

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