# The carmentis protocol: A new method for preventing postpartum depression from preconceive age to puerperium.

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## Abstract

**The Postpartum Depression (PPD) or Postnatal Depression (PND) is one of the different configurations that the psychological suffering of the woman takes in puerperium. PPD is the most common psychic abnormality of childbirth, and it may cause adverse effects on the health and quality of life of the new mother, as well as the child and the partner; it is distinguished from maternity blues (a minor disorder that disappears after a few weeks from birth), from puerperal psychosis (a pathology that requires psychiatric treatment) and from traumatic neurosis (the perception of childbirth as a real trauma). The etiology of PPD focuses on specific risk factors, related to both the genetic and hereditary heritage and the biological variability of women, and to psychological components or social influences. Obstetric factors are no less important, detectable from the remote and close anamnesis of the pregnant women, but also any significant experiences during labor or childbirth. The main objective of this research, especially for health policy, is therefore to develop effective preventive strategies, which allow early detection of patients with significant risk factors. To date, there are methods of high statistical precision screening, which are administered already in term pregnancies or in the immediate postpartum. Screening tools must be able to establish the right timing of action and women acceptability and for this reason it is proposed a new method that includes three different moments of screening and prevention: pre-conceptional age, pregnancy and postpartum (The Carmentis Protocol). It is required the multidisciplinary intervention of several figures that rotate symbiotically in the birth path in its entirety: midwives, first of all, in collaboration with clinical psychologists. The PPD deserves to be focused for its scientific relevance, as the bearer of a constellation of symptoms that need to be recognized and treated, in order to restore the well-being of the dyad first and of the triad afterwards. Prevention is better than cure, acting against the PPD means satisfying a need for the health of the whole society.**

**Keywords:** Postpartum depression, Psychology, Midwifery, Screening, Woman health, Childbirth, Anxiety, Stress.

*Accepted date on January 16, 2019*

## Introduction

Prevention is better than cure. This simple sentence, valid for all the diseases that today are recognized as worthy of screening activities, also applies to the depression. The reason is that acting in a population at risk, before the disease occurs, is simpler and less expensive. Depression, although recognized by the Medical Community as a disease since the days of Hippocrates, still struggles to find a certain social relevance. This is because when we hear about a depressed person, we tend only to bring his current state back to a moment of sadness, anguish, or daily dissatisfaction. Depression, on the other hand, from the Latin *deprimere*, "*press down*", is a pathology that is significantly disabling for those who are affected and rooted in the most inner and personal experiences. Also the perinatal depression and the postpartum one, which involves the pregnant and/or the new mothers, is the symbol of a traumatic experience, which chooses the pregnancy to resurface and affect on a moment as beautiful as difficult. This period is known as one of the most sensitive in life and increases the likelihood of developing the depression precisely [1]. Postpartum Depression, by definition, is depression with onset of symptoms during pregnancy (perinatal) or within 6 weeks of delivery. It occurs in 10%-15% of new mothers and if not diagnosed it is present in 50% of them at 6 months, and in 25% at one year [2]. It is distinguished from Maternity Blues or Postpartum Blues, i.e. a transient change in mood that occurs between the first and tenth day after birth, in 4% up to 80% of women, and is characterized by sudden tears, state mildly

depressed mood, anxiety and fluctuating mood [3]; from Puerperal Psychosis, which is configured as a psychiatric emergency that affects 1-2 women per thousand, especially those who are at the first pregnancy and who have a previous bipolar disorder [4]. In this regard, the maternal condition can worsen towards more serious mental disorders [5], infanticide [6], and even suicide [7]. Post-traumatic Stress Disorder (PTSD) is increasingly present in literature, affecting all new mothers who have traumatic birth experiences, 4% of which meet the diagnostic criteria of PTSD [8]. These circumstances differ from each other in terms of symptomatology, but above all because of the intensity, duration and severity of the signs and symptoms manifested by the woman. The concept of happy pregnancy is merely westernized, also stressed out by stereotyped meanings that can make women feel uncomfortable that this moment does not feel completely joyful. Every woman loves her child from the moment she knows its existence in the embryonic state before, and fetal after, but this does not imply that every depressive thought cannot accompany it together with this strong love. Postpartum Depression damages mothers and newborns, so the purpose of care is to identify the different risk factors and the intrinsic relationships that coexist with each other [9]. All women experience psychological and hormonal changes during pregnancy [10] but the professional mission must offer targeted interventions at all stages of birth. The method proposed by this research is called "*Carmentis Protocol*" and hopes to use 4 different tests, in association with the tests already present for the prevention of PPD after birth: Edinburgh Postnatal Depression Scale (EPDS) and Postpartum Depression Screening Scale (PDSS). The EPDS is a 10-item self-report scale that is given to women on how they felt in the last 7 days, compared to the adaptation of life habits, which occurred after delivery [11]; the PDSS, on the other hand, is a 7-scale self-report questionnaire that investigates the different dimensions of the PPD, or in reduced form for a rapid preliminary screening [12]. Both are administered after birth and represent the gold standard for the prevention of PPD; if used in combination, these tools should consider lower cut-off scores in order to reduce misdiagnoses and improve screening validity [13]. However, the possibility remains that even before the birth, and even in the pre-conception era, there are risk factors that can lead to a management of the woman in early stages of pregnancy and throughout its duration, until the birth occurred. The basic preventive action is the history of the woman, to understand in her life what might have been events, obstetric-gynecological and/or psycho-social relevant, to the point to be prepared precisely for depressive events. All professionals must participate in the identification of the various possible risk factors, for pathology like PPD that is expressed as a disorder of multifactorial etiology, but closely related to the traumatic experience of every pregnant woman. We hope that this tool can be a valuable ally not to make a diagnosis, but to obtain a predictive data useful to build a multidisciplinary path.

### *Hypotheses*

- H1 It is possible that a screening instrument in pre-conceptional times and in the various trimesters of pregnancy will prove to be as effective as or even more than one that only investigates the postpartum age.
- H2 Psychological history and previous history of depression, plus panic attacks, also influence the direct risk factors of Postpartum Depression.
- H3 Obstetric and Gynecological history influence the direct risk factors of Postpartum Depression.
- H4 Multidisciplinary prevention in the different stages of the Birth Path is more appropriate than the treatment performed by a single professional.

## Materials and Methods

The tests of the Protocol were carried out by reviewing the scientific articles published in Literature, concerning the definition, screening, diagnosis, treatment and monitoring of PPD. The methodology of our tests is created to verify if conditions exist already in the pre-conception time, which may be indicative of a future maternal depression. The questions focus on amnestic obstetric, psycho-social and psycho-pathological data, which help the health professional to get a general picture of that woman out of gestation and in projection of her motherhood.

### *Carmentis protocol*

Carmentis, as mentioned, is the name chosen for our new method, based on a Protocol in different phases of the birth path. Precisely this name derives from the goddess Carmenta, protector of pregnancy and birth and patroness of midwives; in addition, the Latin name, or Carmentis, recalls the mind (lat. mens, mentis), which is the object of study of Psychology. The risk factors for the PPD cannot be highlighted by a single professional, and therefore a continuous support is necessary in moments where you work independently, and moments where a group briefing is conducted, comparing the individual disciplinary evaluations that are been obtained. Recent research has identified several psychosocial and biological risk factors for postpartum depression [14] but however, it is not possible to identify unequivocal results with respect to the influence of these factors, above all because there are methodological problems in identifying the right moment in which to collect the clinical history of a woman [15]. The experimental protocol, during the validation phase, is the result of a multi-professional and multi-specialist union that guides the Midwifery/Obstetrics, and the midwives, together with clinical psychologists and Psychology. Only an approach that involves more skills can bring benefits in terms of health, building a bio-psycho-social matrix project that investigates women in a holistic way in every phase of motherhood.

### *Receivers and participants*

It is important, for the new method, to differentiate the nulliparous women, that is women at the first pregnancy, from the pluriparous, that is women who have already had one or more pregnancies. This to see how the answers to the test change with the influence of a child and the different family structure and the couple:

- Women in pre-conception era who want a pregnancy for the first time
- Women in pre-conception era who wish to have another pregnancy and already have one or more children.
- Nulliparous/Pluriparous pregnant women in the first trimester
- Nulliparous/Pluriparous pregnant women in the second trimester
- Nulliparous/Pluriparous pregnant women in the third trimester
- Women undergoing puerperium

***Pre-conception era and pregnancy: Useful informations in the prevention of PPD***

Professional and competent intervention is recommended already in the pre-conception era, in order to reduce the worsening of symptoms of anxiety and stress. The Likert scales used for each question lead to the attribution of various scores which together provide a low, medium or high probability of PPD. Borderline profiles should also be considered. Protocol A is divided into A1 (pre-conceptional age of women without children) and A2 (pre-conceptional age of women with one or more children); the first costs 35 questions, while the second 50. Protocol B, on the other hand, is divided into B1 (I trimester), B2 (II trimester) and B3 (III trimester); the latter are each made up of a total of 40 questions. Each protocol was drawn up based on parity, thus distinguishing nulliparous (women without children) from the pluriparous women (already mothers). Preventive strategies should take this into account because pluriparous are more stressed, as it would seem that as stress increases, so do stress-related cortisol levels [16]. The increase of cortisol, in fact, implies a reduction of the activity of the immune system and the increase of the inflammation, which normally increases during the last trimester of pregnancy-a period in which there is also a high risk of depression [17]. All tests have in common a first part concerning the personal data of the woman, the degree, the professional status and the current sentimental situation. Regarding the relationship with the partner, it asks "*how to evaluate the relationship*", on a negativity-positiveness scale to which a maximum score is assigned if the relationship is very negative, and on the contrary 0 if the woman thinks she has a very positive relationship. Indeed, being unmarried has been assessed as a risk factor for PPD [18], because man is the main source of support in the new family that is being created or created. Always in common, there is a section dedicated to voluptuous habits: smoking, alcohol, drugs; every single condition is assigned a risk score of 0.50, which increases by 0.30 if concurrent situations persist. For example, a woman who smokes is valued at 0.50, which becomes 0.80 if at the same time she claims to habitually use alcohol. Socio-economic conditions also play a significant role and in all tests are distinguished in: low, standard or high. Continuing, it is also important to understand if the woman has, besides her husband, the frequent proximity of other subjects familiar to her, such as parents or brothers/sisters. The inclusion of these data arises from a very simple consideration, namely that the risk factors associated with depressive symptoms are predominantly young age, low level of education, smoking during pregnancy, history of previous depression, disadvantaged family economic status, past traumas, lack of social and family support, and anxiety [19,20]. Another focal point is the woman's Obstetric-Gynecological Anamnesis, in fact numerous studies have investigated the possible associations between aspects related to the history of pregnancy and childbirth and the appearance of Postpartum Depression [21]; but not only that, it is fundamental to understand if there have been interventions in the female genital apparatus that have compromised the patient's perception of herself, such as the unilateral annessiectomy, which reduces the possibility of becoming pregnant by 50%. Obstetric complications such as abortion also influence a woman's traumatic experience, and in fact, an increase in positive PPD screening was found in 34.1% of patients two weeks after a miscarriage [22]. However, abortion is not the only relevant factor linked to the anamnesis, since it is also investigated on possible voluntary interruptions of pregnancy [18], extra-uterine pregnancies, and medically assisted fertilization, especially in women with sterility and infertility problems; each of them investigates the number of times these events have occurred, and as these increase, the predictive severity of the test also increases. In A2 there is also information about any pathology arising or concomitant with the previous gestation, which then returns in set B as regards the current pregnancy. Attention to general and obstetric pathology stems from the fact that some conditions of maternal morbidity can increase the risk of PPD; for example, there are indirect risk factors, and in one study [23] it is emphasized that depression and anxiety at the beginning of pregnancy correlate with an increased risk of hypertensive and eclampsia or that pre-gestational obesity induces stress and PPD [24] and gestational diabetes mellitus [25] for the same criterion. Pre-eclampsia and gestational diabetes are present respectively in 5%-8% [26] and in about 6% [27] of pregnancies, being therefore among the most representative pathologies of gestation. Returning and finishing the set A1, the test continues projecting the woman into the importance ("*Do you think it is important to carry out a pregnancy?*") and in the priority ("*How prior is for you to have a child?*") that associates with her role as mother, or rather a hypothetical motherhood; the whole is also conjugated to the frequency with which one imagines parent ("*How often do you think of having a child?*"), so that you can confirm that the legitimate desire to have a child does not become obsession and therefore maintain awareness in the transition from the role of a daughter [28] to a mother ("*Do you think you are aware of your possible motherhood?*"). Going forward, the idea that they have in seeing the maternity of others rather than their own is also analyzed ("*What does it feel when you see a mother with his child?*") And what feelings unleash this vision: envy/frustration; discomfort/sadness; nothing; serenity/longing; happiness/joy; clearly, the score decreases the closer you get to feelings of positivity and not hostility. Finally, these same emotions are recalled at the end of the test, where the possibility is posed that the woman could not even become a mother ("*Do you think you might not have a child?*") and what you feel about it. Returning again to set A2, this time we

identify the new and characteristic aspects and its purpose to investigate the risk factors related to pregnancy or previous pregnancies; in this sense, the role played by the Accompaniment to Birth Paths (PAB) is important. They are the most sought-after and avant-garde evolution of classical pre-delivery courses, as the term path includes non-teaching or academic support for parenting, but for merely informative and interactive purposes, which leave them to future parents the ability to choose consciously and actively; moreover we talk about birth and not just about delivery, because the event is all-encompassing more moments, of which the delivery is a part of the whole, not the absolute whole. So the excursus begins just when the couple seeks a pregnancy and until they arbitrarily decide to take advantage of professional support, to encourage the extrauterine adaptation of the new-born and the whole family that welcomes it. Mothers, above all, must be prepared at birth and in the delivery room dynamics, through dedicated courses, to reduce the risk of PPD [29]. In the protocol dedicated to the pluriparous the data concerning the labor and delivery modalities previously dealt with deserves importance. Continuing, the satisfaction of the woman is assessed with respect to the birth ("*Overall do you feel satisfied with your delivery-both spontaneous and caesarean*?"), and it is important because a negative perception of birth can lead to many problems such as intentional infertility, tendency to abortion, complications in subsequent pregnancies, increased use of analgesia in subsequent births, increased medical interventionism and medicalization (oxytocin induction, amniotomy and episiotomy), emergency caesarean section, self-determination, PPD, post-stress stress disorder traumatic, negative feelings for the child, delayed attachment of mother and child, relationship problems with the spouse, difficulty in adapting to the role of the sibling and short or long-term breastfeeding problems [30-32]; all these factors are investigated by our protocol as predictive of perinatal depressive events. Regarding the modalities of labor (spontaneously or pharmacologically induced) there are not enough studies in the literature that are conclusive with respect to the risk of PPD, however it would seem that women who do not receive information on how labor delivery may occur (for example during a PAB) have an increased risk of Postpartum Depression, which can be reduced by training during pregnancy, which also increases the awareness of the woman [29]. On the other hand, for example, with regard to induction of delivery with exogenous oxytocin it is possible that it determines PPD, even if it is unclear whether it is a cause or an effect, since its mechanism is to be considered multifactorial [33]. In labor the execution of Analgesia Epidural is also contemplated, which according to a study would lead to a significant reduction of pain and stress response during natural birth, increasing the risk of Baby Blues in the early postnatal period, but slightly influencing the frequency of Postpartum Depression [34]. Stress, as already analyzed above, is related to an excessive release of cortisol that affects the health of the woman and the unborn child. In addition, related to PPD, it would seem to be the episiotomy, the position taken during delivery and the time of labor delivery (>11 hours) [35]. Going to the birth mode, a meta-analysis [36] suggests that caesarean section increases the risk of PPD, especially if in emergency, even if there is not the same significant correlation with that in election. The reason for which the caesarean section is to be considered dangerous, can be traced to the lack of contact "*skin to skin*" immediately after the natural birth, this practice reduces the risk of depressive symptoms and psychological stress postpartum [37]. A similar situation occurs with respect to the "*rooming-in*" or the practice of resting after delivery, in the same room, new mother and newborn; this, is less in case of prematurity or low birth weight, both factors that require a removal of the dyad to facilitate the admission in the Neonatal Intensive Care Unit and that are configured as risk factors for PPD [38]. These and other factors below are investigated in the test. In fact, another, which is significant because it does not constitute a risk but a protection against PPD is breastfeeding; a research [39] suggested that screening for symptoms of depression during pregnancy may help identify women at risk of early discontinuation of exclusive breastfeeding and that exclusive breastfeeding can help reduce the symptoms of postpartum depression up to 3 months postpartum. The spontaneous question, knowing the innumerable benefits of breastfeeding, is: "*Why do not many women breastfeed?*" and hence the question in the test that investigates which factors affect such an important decision ("*If you have not breastfed do you think you were influenced by decision-making factors external to you-family, society, information on the internet or social media?*"). Another aspect is related to how the relationship is changed with the arrival of a child ("*Do you ever think that with the arrival of a child the relationship with your partner would change?*"), because it is clear that this involves also changes in couple sexuality already during pregnancy [40] and especially after childbirth; the influence is attributable to the interaction between different factors: relational, conjugal, biomedical, psychological and social [41]. Sexual relationships in the couple are therefore made difficult, primarily by pain- dyspareunia ("*Have you ever had episodes of dyspareunia or in general difficulties in sexual intercourse after birth?*")-which arises as a physical disorder related to the unpleasant feeling at the genital level that the woman feels after the birth, but has also been associated with anxiety and depression in the postpartum [42]. In addition, in the thought of being a mother, it is considered positive if the woman claims to maintain her individuality, for example by carving out moments to be alone with the partner or to perform physical activity ("*You happen to cut out moments to be alone with your partner-go out, have dinner, talk without your son/daughter?*"; "*Do you consider having physical activity as a priority or being able to carve out moments for yourself?*"). As regards pregnancy, the B protocol is always distinguished on the basis of parity, but this time the distinction occurs in trimesters, highlighting the psychological aspect of each: B1 (trimester of conflict), B2 (trimester of harmony or adaptation), B3 (trimester of separation). Each of them traces some informative and anamnestic questions of the previous tests, but in addition it has the specifications of each phase. The first trimester (from 0 to 12+6 ws) is defined as the trimester of the conflict, since the woman's feelings are of strong and intense ambivalence. From the physical point of view the main symptoms are nausea and vomiting, which also have a psychosomatic nature, since it emerges the difficulty in accepting change, making space for a

new life especially because the woman is forced to change her daily habits in proper function of the malaise it warns in the first weeks. It is therefore a must to ask if she has suffered from pregnancy hyperemesis ("*Have you ever had any episodes of nausea and vomiting? How often?*"), also because nausea and vomiting are a health problem, and the frequency of depression is higher in patients who had this symptomatology during gestation; in addition, the severity of nausea and vomiting increased with higher depression levels [43]. The second trimester (from 13 ws to 26+6 ws) is instead defined as harmony because the woman finally lives a harmonious adaptation with respect to pregnancy. It is a period of well-being and concentration becomes maximum on the child, and you start to have a mental picture of how it will be ("*Do you ever imagine your child?*"). Conflict has disappeared, and the baby begins to move confirming his existence ("*Do you interact with the child - talk to him, caress your belly?*"). That the child is there is confirmed by ultrasound ("*What feelings do you feel when you do an ultrasound and see the baby in the monitor?*") and the psychological impact this has on the mother's ghost world [44] has been long object of study [45]. The image produces important fantasies about the mother that on one hand induces almost a sort of psychic paralysis with respect to the child [44], but on the other hand, it acts as a function of organization of family dynamics, thus assuming structural and structuring value of the whole parenting process. The recognition of the imaginary child in the real child is actually the key point of all pregnancy and postpartum compared to destabilizing phenomena that can lead to maternal depression; this event takes place at birth but lays the foundations in very precocious times. The third trimester (from 27 ws to the end) is specular to the first, since the conflict returns, not of acceptance but of separation that reveals another crisis of passage that the woman feels. The child begins to have its own individuality, its rhythms, but in the woman resume distressing dreams of giving birth to a sick child, but this thought as well as dreamlike can also present itself in the daytime thoughts ("*In the last weeks has it happened to have dreams?*" "*How often did you think of giving birth to an unhealthy child?*"). Also the fear of childbirth and of the pain connected to it are relevant elements ("*Are you afraid of giving birth?*"; "*Are you afraid of pain?*") and must be taken into consideration because they are connected with the symptoms of PPD, especially in nulliparous women. Fear of childbirth could make the pregnancy experience more negative and prepare for a PPD [46]. Finally, to be evaluated is also the instinct of "*prepare the nest*", that is to prepare the nest whitening the house, arranging the furniture differently or arranging the objects of the unborn child ("*Did you recently make changes to your house?*"). These attitudes make the woman very active; they help her in the process of receiving the child away from the thought of not being able to give birth ("*How often do you think you are not able to give birth?*"). All these elements are the fulcrum of the proposed protocol and lay the foundations of a good preventive activity to contain every state of mind.

***Postpartum and puerperium***

On the one hand we believe that the pre-gestational and gestational anamnestic evaluation, in the form of different tests, is essential for an even earlier screening of the Postpartum Depression, on the other we also believe that the phase immediately after delivery and the entire postpartum they already have very good preventive methods, even after 15 months from birth [47]. However, PPD screening strategies do not yet represent a good quality-price ratio for National Health Systems; to determine this there is the potential additional cost of managing women who are then misdiagnosed as depressed, false positives [48]. Therefore, a prompt diagnosis is also a priority, as well as a correct early subdivision of strongly suspect women from those that have negligible and indirect risk factors.

## *Anxiety, depression and panic attacks*

The available studies on the risk factors of PPD have also highlighted other factors, which acquire relevance within the entire protocol: levels of stress perception and personality characteristics [49]; in fact, traits of anxious or tending to depressive personalities may have influence in the onset of the PPD [50]. It is also known that one of the most predisposing factors to the onset of depression is having already suffered in the past [51]. Therefore a recurring item in each test (A or B) is the section dedicated to depression, anxiety, and in addition to panic attacks ("*Have you ever been diagnosed with depression?*"; "*Have you ever taken psychotropic drugs?*"; "*Have you ever suffered from anxiety or panic attacks?*") to identify women who require intensive attention based on their clinical history early. Situations of stressful life [19] or destabilizers play an equally indicative and disturbing role, for this reason a scale of events has been added (from the most serious to the less serious one according to Engel, 1962 & Holmes-Rahe, 1967) that could have influenced the patient's mood [52,53]:

- Death of a loved one (spouse, parent, etc.)
- Your serious illness or a sick family member
- Episodes of violence
- Loss or change of work
- Separation or interruption of affective relationships (friends, acquaintances, etc.)

Each of them is assigned a risk score with respect to the incidence they have, to reduce the negative consequences through targeted and timely intervention. If the woman is also helped to deal with these circumstances, through psychological behaviors and defenses such as to drain and release the emotional tension, the outcomes will be better. Compared to the attitude and behavior towards events that have occurred in recent months, from the administration of the test, it also investigates the problem-solving skills that women recognize to herself; this is also a hypothetically positive or negative prognostic factor ("*In the last 6 months how often did you feel you did not have control over the important things in life?*"; "*In the last 6 months how often did you feel confident about your ability to manage personal and family problems?*"; "*In the last*

*6 months how often did you feel that there were too many difficulties to the point of not being able to overcome them?*").

## Results

The test, which as mentioned is undergoing validation, has been preliminarily administered to two patients in pre-conception, in the article will be called SD and FL to maintain their privacy; to the first was given the A1 protocol test, while the A2 protocol to the second one. SD is a 34-year-old woman, with a high school diploma, well-employed and married for several years; the evaluation of the relationship with the spouse is maximum ("*Very positive*"), the socio-economic conditions of the couple are standard and they live alone in a nation far from the one of origin. The woman comes to our attention because she is very desirous of a pregnancy, but is affected by an alteration of the 17-OH progesterone dosage, which according to medical diagnosis would create her presumed infertility and for which she takes drugs. From the obstetric-gynecological point of view the patient has no children, has neither had abortions nor voluntary interruptions of pregnancy or extrauterine pregnancies and has not undergone reproductive system interventions. She also declares that he has never used Medically Assisted Procreation (MAP), but that in the near future she would like to. About the woman is also clinically reported a II grade obesity, which alone could already explain difficulties in conception [54], however, there are still risk factors linked to the excessive fury in the persistent attempt to become pregnant; this is responsible for anxiety, panic attacks and negative inner states, which hinder pregnancy; for this reason it is important to dedicate time to oneself, to the partner and often willingly when the mental project is stripped of superfluous efforts, the child arrives. The score obtained by the patient for the risk of PPD is not excessively high, but remains at an average of 54.9 (<10 the patient is not at risk and >90 the patient is severely at risk), although some answers are indicative of the suspect clinical trial for which it has been screened. In fact, to the question "*How important it is to carry out a pregnancy*" the woman answers "*Really important",* quantifying the maximum risk score for the question; as it happens with respect to the frequency ("*How often do you think about the possibility of having a child?*") that is referred to as "*Always*" during all the days. Even the emotional aspect is manifested at risk because the question "*What does you feel when you see a mother with her child?*" the answer is highly at risk ("*Envy/Frustrated*") symbol of the desired result but not yet obtained. However, SD expresses awareness of the question concerning her motherhood, and she feels reflected in the phrase "*I would be a good mother for my son*" mentioned in the test as self-assessment. Despite an average introspective capacity, the thought of not being able to become a mother hovers at the last question – "*Do you think you might not have a child?*" to which "*Always*" answers. Finally, the patient was advised to perform physical activity and a proper diet to improve her physical well-being and to divert concentration on her health even before pregnancy, currently surrounded by anxiety and persistent stress. It has been found that stress related to infertility has a greater impact on emotional distress than on marital satisfaction [55]. The advice is to monitor the patient in the later stages of his life through psychotherapy and multidisciplinary support, which also involves professionals who deal with infertility and factors predisposing to failure to conceive. In the event of a possible pregnancy, in order to detect in time any deviations of the average towards a concrete risk of PPD, it is recommended to repeat the test in all trimesters, including the postpartum to evaluate in statistical but also clinical terms, the outcome of the woman and the perception of the psycho-obstetric risk of developing diseases related to the condition prior to pregnancy (both stress and obesity). FL is a young woman of 25 years, she has a middle school diploma, since she became pregnant she became a housewife and she's married; even in her case the evaluation of the relationship with the spouse is maximum ("*Very positive*"). The patient does not take drugs, does not smoke, does not drink and it would seem, up to this point, not to have a particularly high risk for episodes of anxiety and depression. In fact, her socio-economic conditions are standard, and she does not live entirely alone, because in addition to her husband, she is helped by both parents. FL already has a child of just over a year, and because of the relationship she has with her, the patient comes to our attention and performs at first the PDSS, in which even at a distance shows a very high result. The problem of mother-child attachment was first approached by Bowlby, defining it as an emotionally significant link established between the two components of the dyad and is selective because the object of attachment is chosen that benefits and benefits from this proximity [56]. In this case, the mother carries out a child protection behavior, receiving feedback of a genetic nature, since even the smallest infants are provided with innate response patterns. The reason for this premise is easy: our patient has altered the physiological principles of attachment, showing excessive and morbid anxiety, which pours on the child in a totally stressful way; the mere thought of leaving it to someone causes her to suffer and worry, as if she had a duty to protect her constantly. This behavior has altered the woman's life habits to the limit of the obsession and the inability to detach her daughter, both to favor her autonomy and growth, and to carve out normal moments of separation as a woman and wife, not only as a mother. FL then runs the new test of our protocol, dedicated to pre-conceptional women who already have children and the reason lies in the fact that the woman shows willingness to get pregnant again; the question is: "*Where does this morbid attachment come from?*" The answer emerges from the obstetric-gynecological anamnesis. The patient had two miscarriages (one of which not at an early age) for which she underwent curettage and an ectopic pregnancy for which she underwent an annessiectomy. The first thought then is that the previous losses have created a profound fracture in this young woman, undermining her awareness of being able to be a solid foundation of protection and support for her children; in fact, women with a history of pregnancy loss have an increased risk of depression and anxiety, including post-traumatic stress disorder, after the birth of a future child [57]. Another particularly significant element is the duration of the one-off gestation carried out: 42 ws, protracted by far until the maximum waiting period. On the psycho-somatic level it would almost seem that the patient wanted to keep the child within herself as long as possible,

manifesting already in uterus a pathological attachment in not wanting to let her go for fear of reoccurring inauspicious outcomes. The risk factors, continuing in the test, are many and justify both the current maternity condition and the hypothetical condition, as requested by the patient. The woman is thrombophilic, and this already explains the clinical inability to carry on a pregnancy [58], but we should understand how much was supported at a professional level, both gynecological-obstetric and psychological, to metabolize and contain the load of previous unpleasant events. In addition, she says she has never participated in PAB and therefore did not receive useful information that could have improved the outcomes also in terms of awareness of the maternal and child sphere. Regarding labor, it was induced pharmacologically, and the cesarean was then performed urgently due to fetal malposition. These are all risk factors and especially the woman, in the test, declares that she is not at all satisfied with her delivery; already, at just under half of the test, the analysis does not advocate another pregnancy, because it is strongly at risk for its clinical history never fully lived and shared with careful professionals who could give back to this woman the knowledge that despite the traumatic experience, she could still be a good mother. For the rest, the girl was born in good health but had problems of attachment to the breast, despite the patient strongly desired to breastfeed. It is also evaluated the ability of interaction prepared ("*When you were pregnant did you interact with the child? - Talk to her, caress her*") that is present in the patient and justifies what Winnicot, defined as "*primary maternal concern*", or the specific affective investment that has the mother for her child, manifested with an intense involvement that would be identifiable as "*madness*" (continues Winnicot), if only the attention was not focused on the baby, and if every thought or fantasy was not concentrated on him excluding the surrounding world [59]. If there were no pregnancy, this state of withdrawal would be a real dissociation. However, this tunes the two protagonists of birth, creating a receptivity of dependence on the fetus before, and the newborn afterwards, but which disappears in the first months of delivery and the mother removes even the memory. The patient would never seem to have interrupted this mechanism and recognizes that she is excessively apprehensive, anxious, worried about your daughter answering "*always*" to the reference question. This leads her not to consider the execution of activities aimed at ensuring her well-being as a woman and never alone with her husband. The "*Very prioritized*" answer to the question "*Do you consider having another child a priority?*" in his case is worrisome because she could not, at the moment, implement attitudes and behaviors different from the current ones towards another child. Finally, the patient claims to have had panic attacks, and in the last 6 months she has lost control of the important things in her life and never had the readiness to overcome family and personal problems. As a result, the protocol continues with a close follow-up, which will also continue in the case of further maternity on arrival. The patient declares "*Fear*" compared to the thought of not being able to be a new mother, showing again the sense of incompleteness resulting from the traumatic losses of her young life.

## Conclusion

Depressive disorder is associated with a negative subjective experience of pregnancy or childbirth, which is configured as a psychological experience that is often not given sufficient listening [15], so not all women have a timely diagnosis and remain the need to identify valid treatment strategies and follow-up. PPD influences maternal, child and family health and for this a multi-specialist approach is necessary to obtain a timely diagnosis [60]. Children of women with PPD have difficulty in terms of delay and growth restriction, regardless of when the depressive event started [61]. If the mother is pre-occupied, her mind is occupied by another and cannot accommodate and regulate the emotional states of the child. Our research confirms that PPD can cause infantile dysregulation and a deficit in psychosocial synchronization that represents a psychopathological vulnerability for the child and if no action is taken, PPD is a significant risk factor for the development of the child as well as for the insecure attachment style to the caregiver [62]. Several studies have highlighted the negative development of cognitive, social and emotional development of the child [63,64], this only after birth, since there are no alterations in fetal growth in gestational age [65]. Pregnancy is also a complex phenomenon that seems underestimated at the clinical and intervention level, which should however be multidisciplinary (Midwives, Gynecologists and Psychologists). If postpartum depression can be prevented, the direct and indirect costs of compromising the mother's personal, social and working functioning and the psychopathological consequences that the child may develop over time will decrease. The most effective strategy, then, is not the late one, but the preventive one, which evaluates the maternal-infant attachment, which Cranley, defined as "*the extent to which the woman manifests behaviors that represent interaction and emotional involvement towards the child who awaits*", and in addition that it might wait, if we consider the importance of finding significant risk factors already in the pre-conceptional era [66]. These natural mechanisms undergo modifications that can be disrupted by the proposed protocol, which stems from an in-depth consideration of the historical-clinical-personal data. Every woman has her own psychological construct of attitudes, behaviors, representations and fantasies, it is up to professionals to understand deviations from normality that inevitably lead to depression and related complications. The use of different professional protocols and competences in the different phases of the perinatal path requires further studies and in-depth analyzes to support them, for which we are confident. Already a review [67] had recommended examining physical, biological and cultural factors in qualitative studies and those with appropriate methodological qualities, as the appearance of PPD in women with pathological and at-risk pregnancies is detectable already from the first days after childbirth, in which attachment to the child is weak if there is a history of symptoms of perinatal depression [68]; but not only, screening tools must be able to establish the right timing and acceptability on the part of women. It is our opinion that the right timing mentioned above is not just the postpartum, but that the role of our protocol in the treatment of PPD reduces the obstacles to therapeutic

recommendations that include access to psychotherapy services [69] already when the couple plans to have a baby. It has been documented how the risk of depression influences maternal behavior, limiting emotional expression and the quality of relational exchanges, within the process of reciprocal emotional regulation [70]. However, this is not evident only in the postpartum, since it should not be forgotten that Braibanti, (1980) divided the entire period of his birth into temporal arcs of: endogestional age, childbirth and esogestational age, all specular to each other [71]. The decision to divide the tests according to conflict, harmony and separation is not random; these are all gestational moments that are also agreed in the postpartum, especially because in the esogestational period, i.e. the 9 months after birth, are as important as those in uterus. Just as all obstetric risk factors that have repercussions on the psyche and on maternal adaptation are important in the period preceding pregnancy, which is expressed both when you get pregnant and if you are constantly striving for it. There are several risk factors that lead women to postpartum depression. Therefore, early diagnosis and the proper management of symptoms and risk factors for postpartum depression and social support can help both the physical and psychological conditions of postpartum women [72]. However, women who have undergone interventions that are harmful to their fertility, episodes of poliabortivity, or loss in uterus should never be left without attention, but should be directed to specialist psychotherapy supports to process mourning and loss. Getting to a pregnancy does not imply the spontaneous and immediate resolution of past traumas, especially because they return in a beautiful moment as much as a great vulnerability such as pregnancy, birth or puerperium. The attachment of these women persists in the child that could have been but was not, which remains blocked only in their imagination and which has never been able to materialize. Women need health policy programs that implement professional training and social information. Anyone who has experienced a trauma or a major change can never be left alone, but must receive timely, scientific support and involving professionals who are attentive and prepared towards a single goal: the health of women, children and the whole family.

## References

1. Katon W, Russo J, Gavin A. Predictors of postpartum depression. J Womens Health. 2014;23(9):753-9.
2. Trop J, Gendenjamts B, Bat-Erdene U, et al. Postpartum depression in Mongolia: A qualitative exploration of health care providers' perspectives. Midwifery. 2018;65:18-25.
3. Gonidakis F. Maternity blues. Psychiatriki. 2007;18(2): 132-42.
4. Osborne LM. Recognizing and Managing Postpartum Psychosis: A Clinical Guide for Obstetric Providers. Obstet Gynecol Clin North Am. 2018;45(3):L455-68
5. Gavin NI, Gaynes BN, Lohr KN, et al. Perinatal depression: A systematic review of prevalence and incidence. Obstet Gynecol. 2005;106:1071-83.
6. Clare CA, Yeh J. Postpartum depression in special populations: A review. Obstet Gynecol Surv. 2012;67(5): 313-23.
7. Comtois KA, Schiff MA, Grossman DC. Psychiatric risk factors associated with postpartum suicide attempt in Washingron State, 1992-2001. Am J Obstet Gynecol. 2008;199(2):120.e1-5.
8. Yildiz PD, Ayers S, Phillips L. The prevalence of posttraumatic stress disorder in pregnancy and after birth: A systematic review and meta-analysis. J Affect Disord. 2017;208:634-45.
9. Liu S, Yan Y, Gao X, et al. Risk factors fort postpartum depression among Chinese women: Path model analysis. BMC Pregnancy Childbirth. 2017;7(1):133.
10. Mughal S, Siddiqui W. Depression, Postpartum. StatePearls. 2018.
11. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. Br J Psychiatry. 1987;150:782-6.
12. Beck CT, Gable RK. Comparative analysis of the performance of the Postpartum Depression Screening Scala with two other depression instruments. Nurs Res. 2001;50(4):242-50.
13. Zhao Y, Kane I, Wang J, et al. Combined use of the Postpartum Depression Screening Scale (PDSS) and Edinburgh Postnatal Depression Scale (EPDS) to identify antenatal depression among Chinese pregnant women with obstetric complication. Psychiatry Res. 2015;226(1):113-9.
14. Yim IS, Tanner Stapleton LR, Guardino CM, et al. Biological and psychosocial predictor of postpartum depression: systematic review and call for integration. Annu Rev Clin Psychol. 2015;11:99-137.
15. Monti F, Agostini F. Postnatal depression. Carocci Editore. 2013.
16. Gillespie SL, Mitchell AM, Kowalsky JM, et al. Maternal parity and perinatal cortisol adaptation: The role of pregnancy-specific distress and implication for postpartum mood. Psychoneuroendocrinology. 2018;97:86-93.
17. Kendall-Tacket K. A new paradigm for depression in new mothers: the central role of inflammation and how breastfeeding and anti-inflammatory treatments protect maternal mental health. Int Breastfeed J. 2007;2:6.
18. Fisher J, Cabral de Mello M, Patel V, et al. Prevalence and determinants of common perinatal mental disorders in women in low-and lower-middle-income countries: a systematic review. Bull World Health Organ. 2012;90(2): 139-149H.
19. O'Hara MW, McCabe JE. Postpartum depression: Current status and future directions. Annu Rev Clin Psychol. 2013;9:l379-407.
20. Mirabelli F, Michielin P, Piacentini D, et al. Positive screening and risk factors of postpartum depression in women who attended antenatal courses. Riv Psichiatr. 2014:49(6);253-64.
21. Hyun JC, Kwon JH, Lee JJ. Antenatal Cognitive-behavioral Therapy for Prevention of Postpartum

Depression: A Pilot Study. Yonsei Med J. 2008;49(4): 553-62.
22. Mutiso SK, Murage A, Mukaido AM. Prevalence of positive depression screen among post miscarriage women- A cross sectional study. BMC Psychiatry. 2018;18(1):32.
23. Kurki T, Hillesmaa V, Raitasalo R, et al. Depression and anxiety in early pregnancy and risk of preeclampsia. Obstet Gynecol. 2000;95(4):487-90.
24. Ruyak SL, Lowe NK, Corwin EJ, et al. Prepregnancy Obesity and a Biobehavioral Predictive Model for Postpartum Depression. J Obstet Gynecol Neonatal Nurs. 2016;45(3):326-38.
25. Natasha K, Hussain A, Khan AK. Prevalence of depression among subjects with and without gestational diabetes mellitus in Bangladesh: A hospital based study. J Diabetes Metab Disord. 2015;14:64.
26. Jim B, Karumanchi SA. Preeclampsia: Pathogenesis, Prevention, and Long-Term Complications. Semin Nephrol. 2017;37(4):386-97.
27. Mack LR, Tomich PG. Gestational Diabetes: Diagnosis, Classification, and Clinical Care. Obstet Gynecol Clin North Am. 2017;44(2):207-17.
28. Ververk, GJ, Denollet J, Van Heck GL, et al. Personality factors as determinants of depression in postpartum women: A prospective 1-year follow-up study. Psychosom Med. 2005;67(4):632-7.
29. Unsal Atan S, Ozturk R, Gulec Satir D, et al. Relation between mothers' types of labor, birth interventions, birth experiences and postpartum depression: A multicenter follow-up study. Sex Reprod Healthc. 2018;18:13-18.
30. Peterson WE, Charles C, DiCenso A, et al. The Newcastle Satisfaction with Nursing Scales: A valid measure of maternal satisfaction with inpatient postpartum nursing care. J Adv Nurs. 2005;52(6):672-81.
31. Fenwick J, Gamble J, Nathan E, et al. Pre- and postpartum levels of childbirth fear and the relationship to birth outcomes in a cohort of Australian women. J Clin Nurs. 2009;18(5):667-77.
32. Gungor I, Beji NK. Development and psychometric testing of scales for measuring maternal satisfaction in normal and caesarean birth. Midwifery. 2012;28(3):348-57.
33. Cardaillac C, Rua C, Simon EG. Oxytocin and postpartum depression. J Gynecol Obstet Biol Reprod. 2016;45(8): 786-95.
34. Riazanova OV, Alexandrovich YS, Ioscovich AM. The relationship between labor pain management, cortisol level and risk of postpartum depression development: a prospective nonrandomized observational monocentric trial. Rom J Anaesth Intensive Care. 2018;25(2):123-30.
35. Mohammad KI, Gamble J, Creedy DK. Prevalence and factors associated with the development of antenatal and postnatal depression among Jordanian women. Midwifery. 2011;27(6):e238-45.
36. Xu H, Ding Y, Ma Y, et al. Cesarean section and risk of postpartum depression: A meta-analysis. J Psychosom Res. 2017;97:118-26.
37. Bigelow A, Power M, MacLellan-Peters J, et al. Effect of mother/infant skin-to-skin contact on postpartum depressive symptoms and maternal psychological stress. J Obstet Gynecol Neonatal Nurs. 2012;41(3):369-82.
38. Mauri M, Banti S. Post-partum depression. J Psychopathol. 2003;9:2.
39. Figuredo SF, Mattar MJ, Abrao AC. Baby-Friendly Hospital: prevalence of exclusive breastfeeding at 6 months and intervening factors. Rev Esc Enferm USP. 2013;47(6):1291-7.
40. Bogren LY. Changes in sexuality in women and men during pregnancy. Arch Sex Behav. 2001;20(1):35-45.
41. Morof D, Barrett G, Peacock J, et al. Postnatal depression and sexual health after childbirth. Obstet Gynecol. 2003;102(6):1318-25.
42. Rosen NO, Pukall C. Comparing the prevalence, risk factors, and repercussions of postpartum genito-pelvic pain and dyspareunia. Sex Med Rev. 2016;4(2):126-35.
43. Sahin S, Ozdemir K, Unsal A, et al. Evaluation of frequency of nausea and vomiting as well as depression level in pregnant women. Clin Exp Obstet Gynecol. 2016;43(5):691-7.
44. https://www.abebooks.fr/rechercher-livre/titre/la-dynamique-du-nourrisson-ou-quoi-de-neuf-b%E9b%E9/auteur/collectif/
45. Missoninier S. Perinatal therapeutic consultation. Raffaello Cortina Editore. 2003.
46. Gosselin P, Chabot K, Beland M, et al. Fear of childbirth among nulliparous women: Relations with pain during delivery, post-traumatic stress symptoms, and postpartum depressive symptoms. Encephale. 2016;42(2):191-6.
47. Vogeli JM, Hooker SA, Everhart KD, et al. Psychometric properties of the postpartum depression screening scale beyond the postpartum period. Res Nurs Health. 2018;41(2):185-94.
48. Paulden M, Palmer S, Hewitt C, et al. Screening for postnatal depression in primary care: Cost effectiveness analysis. BMJ. 2009;339:b5203.
49. Leung BM, Letourneau NL, Giesbrecht GF, et al. Predictors of postpartum depression in partnered mothers and fathers from a longitudinal cohort. Community Ment Health J. 2016;53(4):420-431.
50. Baldoni F, Ceccarelli L. Paternal perinatal depression. A review of clinical and empirical research. Childhood Adolesc. 2010;9(2):79-92.
51. O'Hara MW, Wisner KL. Perinatal mental illness: definition, description and aetiology. Best Pract Res Clin Obstet Gynaecol. 2014;28(1):3-12.
52. Engel GL. Psychological development in health and disease. WB Saunders.1962.
53. Holmes TH, Rahe RH. The Social Readjustement rating scale. J Psychosom Res. 1967;11:213-218.
54. Broughton DE, Moley KH. Obesity and female infertility: Potential mediators of obesity's impact. Fertil Steril. 2017;107(4):840-847.

55. Gana K, Jakubowska S. Relationship between infertility-related stress and emotional distress and marital satisfaction. J Health Clin Psychol. 2016:21(6);1043-54.
56. Bowlby J. Attachment and loss. Basic Books.1969.
57. Giannandrea SA, Cerulli C, Anson E, et al. Increased risk for postpartum psychiatric disorders among women with past pregnancy loss. J Womens Health. 2013;22(9):760-8.
58. Pritchard AM, Hendrix PW, Paidas MJ. Hereditary Trombophilia and Recurrent Pregnancy Loss. Clin Obstet Gynecol. 2016;59(3):487-97.
59. Winnicott DW. The Capacity to Be Alone. In D.W. Winnicott (Ed.), The Maturational Processes and the Facilitating Environment. London: Karnac Books. 1958.
60. Capik A, Durmaz H. Fear of Childbirth, Postpartum Depression, and Birth-Related Variables as Predictors of Posttraumatic Stress Disorder After Childbirth. Worldviews Evid Based Nurs. 2018;15(6):455-63.
61. Abdollahi F, Rezai Abhari F, Zarghami M. Post-Partum Depression Effect on Child Health and Development. Acta Med Iran. 2017;55(2):109-14.
62. Coyle N, Jones I, Robertson E, et al. Variation at serotonin transporter gene influences susceptibily to bipolar affective puerperal psychosis. Lancet. 2000;356(9240): 1490-1.
63. Murray RM, Fearon P. The developmental "risk factor" model of schizophrenia. J Psychiatr Res. 1999;33(6): 497-9.
64. Kim-Cohen J, Moffitt TE, Taylor A, et al. Maternal depression and children's antisocial behavior: Nature and nurture effects. Arch Gen Psychiatry. 2005;62(2):173-81.
65. Grobman WA, Wing DA, Albert P, et al. Maternal Depressive Symptoms, Perceived Stress, and Fetal Growth. J Ultrasound Med. 2017;36(8):1639-48.
66. Cranley MS. Development of a tool for the measurement of maternal attachment during pregnancy. Nurs Res. 1981;30(5):281-4.
67. Norhayati MN, Hazlina NH, Asrenee AR, et al. Magnitude and risk factors for postpartum symptoms: A literature review. J Affect Disord. 2015;175:34-52.
68. Koss J, Bidzan M, Smutek J, et al. Influence of Perinatal Depression on Labor-Associated Fear and Emotional Attachment to the Child in High-Risk Pregnancies and the First Days After Delivery. Med Sci Monit. 2016;22:1028-37.
69. Pearlstein T, Howard M, Salisbury A, et al. Postpartum depression. Am J Obstet Gynecol. 2009;200(4):357-64.
70. Ammaniti M, Speranza AM, Tambelli R, et al. A prevention and promotion intervention program in the field of mother-infant relationship. Infant Ment Health J. 2006;27(1):70-90.
71. Braibanti L, Braibanti P. Nascere Meglio. Editori Riuniti. 1980.
72. Youn H, Lee S, Han SW, et al. Obstetric risk factors for depression during the postpartum period in South Korea: A nationwide study. J Psychosom Res. 2017;102:15-20.

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