Postpartum depression is a debilitating mental disorder with a high prevalence. The aim of this study was review of the related studies. In this narrative review, we report studies that investigated risk factors of postpartum depression by searching the database, google scholar, PubMed, ScienceDirect, UpToDate, Proquest in the period 2015-2019 published articles about the factors associated with postpartum depression were assessed in English. The search strategy included a combination of keywords include postpartum depression and risk factors or obstetrical history, social factors, or biological factors. Literature review showed that risk factors for postpartum depression in the area of economic and social factors, obstetrical history, and biological factors, lifestyle and history of mental illness detected. Data from this study can use for designing a screening tool for high-risk pregnant women and for designing a prevention program.

**Keywords:** Postpartum depression, risk factors, pregnancy, child birth

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**INTRODUCTION**

Postpartum depression is a form of depression, a mental illness, discovered to be common lately in birth mothers affecting roughly 15% to a minimum of 10%. Such a period is very critical due to its nature and effect on Mother-baby bonding and Child’s long-term Development. However, following depressions are found to be very inadequately diagnosed and nursed. According to the survey carried out in this regard revealed that half of such conditions are unidentified by concerned Practitioners or medical Professionals in-charge and revealed that most of the diagnosed mothers, do not follow recommended treatment accordingly. Result of these studies critically emphasized the importance of identifying mothers at risk, application effective precautionary measures to prevent such condition and the dire need for efficient and adequate screening and prompt treatment of Postpartum depression. [2]

Postpartum depression is a severe mental illness. The severity of fatigue and anxiety in suffering mothers is so extreme that some of them term life as death swamp whereas mothers with no such depressions see their child’s birth as a most ecstatic moment of their life. Mothers suffering from this disease suffer from difficulty in bonding with baby, intense irritability, mood swings, Panic attacks, withdrawn from family members, excessive crying, changes in appetite, Harming and suicidal thoughts. Extreme feelings of inability and hopelessness are life threatening and can lead to suicide [3]. The immense impact of postpartum depression can spread into families, which may rise the problems in breastfeeding and lead to lack of intimacy that result in great social distancing. Children born to mothers with untreated postpartum depression are at extreme risk of hindered development or long-term physical, behavioral, mental, and emotional issues [1]

The treatment of Postpartum depression involves, as when needed, coordination of gynecologists and psychologists. The treatment depends upon the score of the scale, such as psychotherapy, antidepressant treatment or both in combination. Psychotherapy is widely accepted as the most effective treatment for PPD. In truth the effectiveness of antidepressants is not evident in postpartum depression, the safety is questioned in the case of breastfeeding because they become the part of Breast milk and are passed into the baby’s serum and its effects on developing brain are not substantially known. [2]

**RISK FACTORS FOR PPD**

**PHYSIOLOGICAL FACTORS**

The occurrence of mental health disorders such as depression during pregnancy is a strong reason in predicting postpartum depression. There is make clear in amplification these relationships signifying that woman with a sure history of depression are other susceptible to hormonal changes. In hold of this finding, it has reported that a history of moderate to terrible premenstrual syndrome (PMS) is a factor dis}

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DOI: 10.55920/IJCIMR.2022.02.001071
The function of corticotropin-releasing hormone in the law of steroid hormones and depression has been considered as well. In additive to hypothalamus, this hormone is in addition bent during pregnancy in placenta, uterus, and ovaries and regulates the pituitary-hypothalamus-adrenal axis for invention of steroid hormones. Stress and the HPA axis are fully associated to the etiology of depression. Depressed patients, plus folks with PPD, program abnormal HPA axis go such as hypersecretion of cortisol and abnormal diurnal emission of cortisol.

After transfer and kicking out of the placenta, dramatic dump of this hormone leads to on sale construction of steroid hormones such as estrogen and leads to bigger leaning to depression in the formerly 12 weeks after childbirth. In women, prominent estradiol levels go on with to increase in intensity during the third trimester but dive dramatically after parturition, primary to the hypothesis that an “estradiol-withdrawal state” during the essential hardly any weeks after parturition contributes to PPD. Corticosterone required globulin (CBG) levels are down throughout the postpartum in rats, which suggests that free CORT levels are advanced during postpartum compared to controls, as CBG binds with CORT.

Estrogen and progesterone levels fluctuate dramatically during the perinatal period, increasing tenfold during pregnancy and returning to pre-pregnancy levels within 72 hours of delivery. This rapid hormonal decline is thought to contribute to PPD in vulnerable women, although a consistent link between hormone levels and PPD has yet to be demonstrated. Steroid hormones play a significant role in depression including PPD. During pregnancy and postpartum, levels of steroid and peptide hormones fluctuate dramatically which could contribute to the etiology of PPD. These changes in hormone levels, such as estradiol, corticosterone, corticotropic releasing hormone (CRH) and oxytocin, occur in humans with different profiles and gestational periods (see Fig. 2). Briefly, in women, progesterone levels are approximately 20× higher during gestation and remain elevated throughout pregnancy, while estradiol levels are very high (200–300× higher) by week 20 of gestation and remain high throughout the rest of pregnancy in women and both these steroid hormones drop with the expulsion of pregnancy.
If you've ever had depression before, or have had it with other pregnancies, you're more likely to get it again. Stress, problems with drugs or alcohol, low self-esteem, or trouble with your pregnancy can make postpartum depression more likely. So can having a baby with special needs. Disappointment.[6]

Postpartum Psychosis

In rare cases, women can have postpartum psychosis, a severe mental illness. It is an emergency and needs immediate medical help. If you have these symptoms, call your doctor. You can’t sleep. You can’t think clearly. You’ve been hallucinating or having delusions, meaning you sense or believe things that aren’t real. You have obsessive and fearful thoughts about your baby. You’re paranoid -- deeply suspicious of other people, and no one can talk you out of it. You refuse to eat. You’ve thought of harming yourself or your baby.

STATISTICS OF POSTPARTUM DEPRESSION

As there is no exact knowledge about postpartum depression however an estimated result shown that from about 1000 births, 10 to 15 per 1000 births have been seen with postpartum depression start soon after child birth and is risk in continuation with postnatal depression. [7]

An important point to note regarding the postpartum depression affect all the races nationality cultural, religion and educational background. It is also noted that postpartum depression is least common among mothers with 16 years of education and is about 8.1 percent as compared to the mothers of all the other educational background. Observations shows that postpartum depression also varied with different races and ethnicity. The proportion of mothers reporting this issue also varied with significantly among different social, racial, and ethnic groups. This can be well understood by the following data collection as given: Non-Hispanic American Indian /Alaska native mothers were more likely to have postpartum depression after child birth as compared to the Non-Hispanic /Hawaiian other pacific islander mothers almost 16.6% to 11.4% according to respective groups. Factors that may increase the risk of postpartum depression include previous depressive episodes, stressful life events, financial instability and limited social support.

Pakistan is the second largest Muslim state located in south Asian region with the population of about 175 million. Almost 33% of Pakistanis are living below the national level poverty line. As Pakistan is a developing country it has a very high rate of maternal mortality, neo-

### Table 1: Showing different outcomes and factors

<table>
<thead>
<tr>
<th>PERSONAL AND SITUATIONAL FACTORS</th>
<th>POSTPARTUM FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal care</td>
<td></td>
</tr>
<tr>
<td>Age, language, culture, race/ethnicity, marital status, education, income, parity, immigrant/refugee status, past history of depression</td>
<td>Infant stress (difficult or easy), gender, infant household role demands, physical health (morbidly, hormonal), shifts, sleep deprivation, social context (support, criticism, family)</td>
</tr>
<tr>
<td>Self-efficacy in managing infant and household</td>
<td>Perceptions of healthcare (access to care, trust)</td>
</tr>
<tr>
<td>Perceptions of birth experience</td>
<td>Cultural proscriptions (dietary, maternal activities)</td>
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<tr>
<td>Intendedness of pregnancy</td>
<td></td>
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natal mortality, and fertility. Having very low or no health budget assigns for the health expenses as compared to the other well-developed countries. The international statistical classification of disease and related health problems explains PPD as a mild mental and behavioural disorder starting from six weeks of delivery (WHO 2007). Accurate data of prevalence of PPD in Pakistan are not much easy to obtain because of cultural norms that may result women under reporting PPD and a lack of reliable screening source that may lead to under-diagnosis of this condition. However, PPD appears to be the major issue in Pakistan with the prevalence rate of 28 percent to 63.3 percent which is the highest among Asian countries. In Pakistan three studies were conducted (Husain et al., 2006; Rahman & Creed, 2007; Rahman, Iqbal, & Harrington, 2003) shows that PPD range from 28.8% to 94% at the time period of 3 months after delivery. And other studies (Ali, Ali, & Azam, 2009; Kalar et al., 2012; Kalyani, Saeed, Rehman, & Mubashir, 2001; Khooharo et al., 2010) related to the time period of 2 to 8 weeks reported that it ranges from 5.2% to 63.3%. [9]. Postpartum depression is one of the most common issues nowadays regarding a:oughment. Almost 10% to 15% of adult mothers seen involved in this depression. And mostly adolescents and mothers that give birth to premature infants got PPD. The disorder last about seven months after this depression. And mostly adolescents and mothers that give birth to premature infants got PPD. The disorder last about seven months after this depression. And mostly adolescents and mothers that give birth to premature infants got PPD. The disorder last about seven months after this depression. And mostly adolescents and mothers that give birth to premature infants got PPD. The disorder last about seven months after this depression. And mostly adolescents and mothers that give birth to premature infants got PPD. The disorder last about seven months after this depression. And mostly adolescents and mothers that give birth to premature infants got PPD. The disorder last about seven months after this depression.

DETECTION

The basic method of case finding and identification of PPD is sensitive clinical inquiry about mood during follow-up visits with obstetrical or primary care providers in the postpartum period. The optimal timing of this inquiry varies across guidelines from shortly after giving birth to 6–12 months later. Some authorities recommend various forms of screening for PPD [13] However, the potential effectiveness of screening for PPD is related to the availability of systems to adequately treat and follow-up women with positive results, so there is some controversy about whether routine screening should be done. The United Kingdom’s National Institute for Health and Care Excellence [13] suggests two-stage screening with the use of a sensitive two-question screening tool for depression. A positive result or clinical concern should lead to further, more definitive assessment. Formal measures such as the Patient Health Questionnaire—or the 10-item Edinburgh Postnatal Depression Scale (EPDS)—may also be helpful, and a positive result on either should lead to a comprehensive clinical assessment to ascertain diagnosis. The American College of Obstetricians and Gynecologists [14] American Academy of Pediatrics [15], and US Preventive Services Task Force [16] recommend routine postpartum screening using the EPDS. A clinical evaluation is the gold standard for determining a diagnosis.

DIFFERENTIAL DIAGNOSIS

As with any other mental disorder, depressive symptoms that are related to untreated medical conditions or that are the direct effects of PPD have ranged widely because of varying criteria for PPD, period under consideration, and populations. An early meta-analysis based on 59 studies with a combined total of 12,810 subjects reported an overall prevalence of PPD of 13%.[12] By subgroup analysis it is found that there is higher level risk of developing postpartum depression in mothers with age greater than 25 than in mothers whose age is less than 25. Almost 4 out of 28 studies shows that high maternal age results are leading cause of PPD because they lack peer mentoring, obstetric complications and by multiple births. Postpartum depression can start soon after childbirth or as a continuation of antenatal depression and needs to be treated. A meta-analysis in developing countries showed that the children of mothers with postpartum depression are at greater risk of being underweight and stunted. Moreover, mothers who are depressed are more likely not to breastfeed their babies and not seek health care appropriately. A longitudinal study in a low- and middle-income country documented that maternal postpartum depression is associated with adverse psychological outcomes in children up to 10 years later. While postpartum depression is a considerable health issue for many women, the disorder often remains undiagnosed and hence untreated. The current literature suggests that the burden of perinatal mental health disorders, including postpartum depression, is high in low- and lower-middle-income countries. A systematic review of 47 studies in 18 countries reported a prevalence of 18.6% (95% confidence interval, CI: 18.0–19.2). Postpartum depression affects 12.5% women on average and is one of the most common complications of pregnancy.[7]
alcohol or other substance use must be ruled out. Medical conditions that can result in symptoms of depression and anxiety, and that are common in postpartum women, include thyroid dysfunction and anemia [17]. Shortly after childbirth, more than 50% of women experience a mild and transient syndrome of low mood, tearfulness, and mild irritability, often called the “postpartum blues.” Postpartum blues tend to last less than two weeks, but some cases may continue and develop into PP. Postpartum blues can be distinguished from a depressive episode by the severity and persistence of the latter. For example, severe obsessionality and suicidality are not usually present with the blues.

OUTCOMES OF PPD:
The studies have consistently demonstrated the deleterious effects of postpartum depression (PPD) on cognitive and emotional development during infancy and later childhood [18]. The mother who is a victim of PPD is not able to raise a child due to her mental disturbance and child has to suffer from many social problems.

TREATMENT OF POST PARTUM DEPRESSION
In Pakistan most of the time people consider postpartum depression as a general outcome of pregnancy and they don’t go for the diagnosis and treatment of PPD but this need to be addressed as is a depression that is not only problem some for mother but also for the child. There is a need to raise awareness among people to take it in a serious way. Postpartum depression is significantly undertreated. Many women feel that depression at what “ought” to be a joyful time is shameful, and others are influenced by society’s general stigma concerning mental health care. In addition, those women who do seek treatment often hesitate to take psychotropic medications when breastfeeding, despite substantial evidence of their relative safety. Moreover, Women who felt uncomfortable reporting PPD symptoms were much more likely to show symptoms of perinatal depression and anxiety [19]. Postpartum depression very is common and affects the woman, infant, and family and its Treatment depends on the severity of symptoms and the level of functional impairment and can include social support, psychological therapy, and pharmacotherapy

Biological Interventions
To date, there have been very few RCTs on the prevention of PPD using biological interventions. Existing studies include treatment with antidepressants, hormones, omega-3 fatty acids, dietary calcium, thyroidine, and selenium, and have met with mixed success include social support, psychological therapy, and pharmacotherapy, interpersonal therapy

Interpersonal therapy
IPT is a short-term psychotherapy focusing on the present and emphasizing the interpersonal context in which depressive symptoms occur. IPT originally was developed to treat Major Depressive Disorder in a general adult population, but has been adapted to treat women during the perinatal period. Maternal attachment, sensitivity and parenting style are essential for a healthy maturation of an infant’s social, cognitive, and behavioral skills and depressed mothers often display less attachment, sensitivity and more harsh or disrupted parenting behaviors, which may contribute to reports of adverse child outcomes in children of depressed mothers.

Mental health care:
Mothers with PPD compared to those without symptoms had lower economic status, were more likely to be single, to be first-time mothers, have an unemployed partner. Mothers with PPD preferred private mental health practice and community treatment centers by mental healthcare professionals. [21]. They also preferred group interventions and personal psychotherapy rather than technology-based interventions.

Psychosocial support:
The severity of ppd among patients ranged from minimal depression to severe depression. Psychosocial support proved to be the most effective intervention that has been used by the healthcare workers to reduce depressive symptoms [22]. Psychosocial support has been the most effective intervention in its management. Postpartum depression may affect socialization behaviors in children and the mother, and it may lead to thoughts of failure leading to deeper depression. Frequent screening exercises for postpartum depression should be organized by authorities of the hospitals in conjunction with the Ministry of Health.

Quality of infant–parent relationship
The quality of the parent–infant interaction is essential for the infant’s development and for relieving of ppd and is most objectively measured by observation. The existing observational tools for assessing parent–infant interaction was identified and described, and their psychometric soundness was evaluated [23].

Genetics
Genetic factors have also been implicated in the pathophysiology of PPD [24]. Exciting evidence of genetic contribution has emerged from family and twin studies suggesting that PPD clusters in families. Candidate gene studies of PPD have identified several of the same polymorphisms found in no perinatal depression, such as Val66Met polymorphism of brain-derived neurotrophic factor. Genome-wide linkage of women patient has found genetic variations on chromosome 1q21.3–q32.1 and 9p24.3–p22.3 and in Hemicentin-1 (HMCN1), which contains several estrogen-binding sites. All appear to increase susceptibility to PPD. Estrogen-induced epigenetic DNA methylation changes have also been implicated in PPD [24].

Immune Function
The immune axis is regulated by estradiol, which fluctuates during the perinatal period. Antiinflammatory cytokines responsible for immu-
Stepped care management of postpartum depression

Nonsuppression are elevated in pregnancy to protect the fetus. However, following delivery, the immune system rapidly becomes proinflammatory and remains so for several weeks. Women with PPD, compared with those who are not depressed, appear to have different gene expression that is functionally related to immunity. Studies of several prenatal immune markers of PPD have reported contradictory findings, so the role of immune function in PPD remains unclear [25].

Figure 6: Stepped care management of postpartum depression (PPD). Safety of mother and infant should be continually reassessed at each level of care such that emergency services can be initiated if required. Abbreviations: CBT, cognitive behavior therapy; ECT, electroconvulsive therapy; IPT, interpersonal therapy; SSRI, selective serotonin reuptake inhibitor.

MANAGEMENT

The effective management of PPD requires a comprehensive and often multidisciplinary approach (Figure 6).

Once a diagnosis of PPD is made and comorbid medical and psychiatric problems are addressed, psychosocial strategies to increase self-care, enhance practical and emotional social supports, and reduce the occurrence and/or impact of negative life events or stressors are warranted for all women. Specifically, some evidence supports a small reduction in PPD symptoms from aerobic exercise [26,27]. Infant behavioral sleep interventions that lead to a greater amount of maternal sleep can also improve maternal mood [28]. When considering an infant sleep intervention, it is often helpful to ask if the woman can sleep when the baby sleeps to separate insomnia from normal lack of sleep resulting from infant care. For women with mild symptoms, psychosocial strategies such as peer support or nondirective counseling from a professional may be helpful on their own. Women with symptoms of at least moderate severity often require additional treatment strategies to achieve remission. In such cases, treatment options should be explained and maternal treatment preferences should be sought, including desire for nonpharmacological versus pharmacological strategies and group versus individual interventions. This is an important time in the management plan to consider potential barriers in access to or uptake of treatment. These may include shame or stigma around diagnosis and treatment, as well as practical challenges to uptake of care such as lack of transportation, unpredictable child schedules, competing childcare responsibilities, limited mobility after caesarean section, or limited access to specialized services in certain regions. Innovative models of care, including colocation of mental health within obstetrical care services, are showing promise in increasing affected women’s engagement in care [29]. Emerging evidence suggests electronic health (e-health) interventions that target some of these barriers by allowing private and secure psychological and psychiatric virtual care are highly acceptable to women [30,31]. It is important to note that treatment of maternal depression may not by itself improve maternal–child interactions and child outcomes. A recent systematic review found that both psychological interventions [cognitive behavior therapy (CBT) and interpersonal therapy (IPT)] and antidepressant medication have a positive effect on parental adjustment, attention to the infant, and child behavior. It is less clear whether these interventions improve parental stress and/or maternal–child attachment, necessitating attention to this issue in future trials [32].

Somatic Therapies

Most women with PPD prefer psychological to pharmacological treatments, and a desire to avoid medication, particularly in lactation, is thought to be a barrier to adequate treatment for women with moderate to severe symptoms of PPD. Electroconvulsive therapy (ECT) is a somatic therapy that is one of the most effective treatments in psychiatry. It may be used to treat severe PPD, especially in the setting of intractable suicidality or psychotic symptoms [33]. Since ECT requires a general anesthetic and can have side effects such as memory impairment, it is not an ideal option for most women. Evidence is mounting for the efficacy and safety of focal brain stimulation therapies such as repetitive transcranial magnetic stimulation and transcranial direct current stimulation [34]. These therapies may have a role to play in PPD treatment in women for whom psychotherapy or pharmacotherapy do not induce remission or those who are reluctant to use antidepressant medication while breastfeeding [35]. Trials to evaluate the safety and efficacy of neurostimulation treatments for PPD are required.

Psychosocial and Psychological Interventions

There is evidence to support the use of psychosocial strategies such as peer support and nondirective counseling from a professional for women with mild PPD. Peer support is distinct from other psychosocial support strategies in that the provider has experiential knowledge of the condition. It has been evaluated in clinical trials delivered in-person (including in-home) and virtually (e.g., by telephone, and more recently using e-health technology). Women find peer support highly acceptable, and it may reduce PPD symptoms on its own [36]. Nondirective counseling by professionals or paraprofessionals may reduce symptoms but not to the extent of psychological or pharmacological interventions. Various psychological interventions have been evaluated for efficacy in PPD treatment. CBT and IPT are both time-limited interventions that have been specifically adapted for PPD and well-studied in this area. Their efficacy profiles tend to be like each other compared to usual care or control interventions (25). Gains are demonstrated immediately post-treatment, as well as in longer-term follow-up (six months after the conclusion of treatment). Other types of psychological interventions, including dynamic therapy, may also be effective [37].

Pharmacological Interventions

When PPD is severe or not sufficiently responsive to psychological treatment, antidepressant medication may be required, either on its own or in addition to nondrug therapy. The first-line antidepressant medications for PPD treatment are the selective serotonin reuptake inhibitors (SSRIs). Other antidepressants may be used when a mother has achieved remission on them antenataly, or when first-line antidepressant medications are ineffective or poorly tolerated. Antidepres-
sants for PPD have been evaluated in randomized controlled trials and shown to result in higher remission rates compared to placebo, although whether any specific antidepressant is more effective than another for PPD is not clear. Infant exposure through lactation must be considered when recommending pharmacological treatment. Most antidepressants are not contraindicated during breastfeeding. The SSRI sertraline appears to have the most minimal passage into breastmilk and so is preferred when a woman is newly starting therapy, but switching from another SSRI for safety purposes is not usually recommended, since a medication switch could increase risk for relapse [17]. All SSRIs pass minimally into breastmilk at a level considered compatible with breastfeeding; rarely has a serious adverse event been reported in an exposed healthy full-term infant. As such, the clear benefits of breastfeeding in most cases outweigh concerns about SSRI exposure. The risks of breastfeeding in premature or medically ill infants should be individually determined in consultation with the pediatrician. When difficulties with breastfeeding are precipitating and/or perpetuating factors of the depression itself, then formula feeding can be considered a healthy and preferred alternative. The latter may be a more reasonable alternative in developed countries, where contamination of formula related to lack of access to clean water is not a problem. When SSRIs are ineffective, women may be switched to other antidepressants, on which less information exists about lactation exposure. In general, serotonin norepinephrine reuptake inhibitors (SNRIs) and mirtzapine appear to have minimal passage into breastmilk [38-40], whereas bupropion is avoided if possible due to some case reports of infant seizure [41]. Tricyclic antidepressants have greater passage into breastmilk than SSRIs and so are avoided when possible, but if tricyclics are used, nortriptyline is considered to have the best safety profile; doxepin is considered contraindicated given case reports of adverse events in exposed infants. Adjunctive psychotropic medications to treat insomnia and comorbid anxiety (e.g., hypnotics, benzodiazepines) or to augment antidepressant medication response (e.g., antipsychotics or other augmentation agents) may also be used in the setting of PPD. The potential for these medications’ passage into breastmilk and resultant safety effects—both on their own and in combination with the antidepressant—should be considered. Drawing on some of the emerging evidence on the pathophysiology of PPD, some novel interventions are being developed and are under evaluation.

**Recommendations:**

The study findings support the formulation of mother-sensitive health policies based on understanding mothers’ preferences, and thus, help prepare treatment alternatives that will suit different groups of mothers with PPD, for the benefit of mothers, newborns, and families. Disseminating the results of this study among professionals as part of professional training, can promote appropriate treatment facilities and modes of care for mothers with PPD.

**CONCLUSIONS**

PPD is one of the most common complications of childbirth. When untreated, it has the potential for a profound negative impact on mothers, children, and families. Case identification and accurate diagnosis are important. Psychosocial, psychological, pharmacological, and somatic interventions are each effective treatment options for PPD, depending on the severity of the clinical presentation. Uptake of effective treatments is a problem, so innovative treatments and models of care are being developed to combat barriers to treatment acceptability and access. It is hoped that emerging knowledge about the pathophysiology of the disorder and new somatic treatments will lead to the development of promising new treatments for PPD.

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**Volume 2 | Issue 3 | 2022**
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