

Influence Of Maternal Health & Health-Related Behaviours On Post-Partum Depression: A Systematic Review

Mineshi Mishra^{1*}, Purnima Awasthi²

^{1*}Research Scholar, Dept. of Psychology, BHU, mineshimishrabhu@gmail.com

²Professor, Dept. of Psychology, BHU, awasthi.psycho@gmail.com

KEYWORDS

Postpartum depression, Maternal health, Health-related behaviors, Mental health interventions, Physical Activity, Sleep hygiene

ABSTRACT

Postpartum depression (PPD) affects many mothers after childbirth and damages their health while creating long-term consequences for both mothers and their newborns. The review explores how maternal health conditions together with health behaviors affect postpartum depression development and its severity. The research examines maternal health elements including physical activity sleep quality and substance use while omitting regional socioeconomic and cultural differences. The Research studies that evaluated the connection between maternal health indicators and health-related behaviors to PPD were included. The data synthesis combined qualitative and quantitative methods to compute pooled effect sizes when feasible. A total of seventy studies formed the basis of the qualitative synthesis and fifty studies underwent quantitative analysis. The analysis showed that poor sleep quality combined with insufficient physical activity and substance use including smoking and alcohol intake strongly affect PPD severity levels. The risk of PPD decreased when mothers practiced excellent health habits including physical activity and better sleep habits. The study demonstrates that maternal healthcare must incorporate standard PPD screening with physical activity promotion sleep education and substance abuse treatment as part of maternal care standards. Future studies must conduct long-term research activities and develop interventions that advance the comprehension of maternal health effects on PPD prevention and maternal mental health results.

1. Introduction

Postpartum depression (PPD) develops as a major mental health disorder after childbirth during the first year following birth. Postpartum depression creates intense feelings of sadness anxiety and fatigue that make mothers unable to care for themselves and their newborns. Postpartum depression exists as a widespread medical condition worldwide. World Health Organization (WHO, 2022) reports that women worldwide develop PPD after childbirth at rates between 10-15% but Tavares (2024) and Gavin et al. (2005) suggest higher prevalence. PPD creates negative effects on maternal health and results in developmental problems for infants that may extend into long periods of their lives (Fonseca et al., 2020).

The progression of PPD depends on the mother's ongoing health status from pregnancy through the postpartum period. Women who maintain good physical health during pregnancy experience fewer postpartum mental health problems according to Beck (2001). Past childbirth brings forth substantial healing demands so mothers must readjust emotionally while taking on new family duties that may trigger mental health problems. Three fundamental health behaviors including proper nutrition and physical activity and healthcare accessibility function as primary factors which substantially improve maternal wellness (Kalmbach et al. 2022; Yim et al., 2015). These health behaviors maintain their importance from pregnancy through postpartum recovery because they contribute to postpartum healing (Skouteris et al., 2009; Lee & Kelleher, 2016). According to Brown (2023) and Quatraro and Grussu (2020) women who maintain consistent physical exercise before and after childbirth experience reduced depressive symptoms. Women dealing with postpartum mental health problems generally eat poorly while encountering more barriers to healthcare access (Poyatos-León et al., 2017; Lee et al., 2000).

Worldwide communities face PPD as an essential public health challenge needing better targeted preventive actions and treatment approaches (Altemus et al., 2014). The condition severely affects maternal mental well-being which reduces both maternal attachment toward her baby and her capacity to care for her child (Grote et al., 2010). Healthcare systems expose heavy financial strain from PPD because the condition requires elevated medical expenditures while requiring extended care duration (Christian et al., 2018). Maternal health faces additional negative outcomes from underdiagnosed and undertreated PPD which continues to persist (Gobinath et al., 2017; Letourneau et al., 2012). Research efforts have produced numerous findings about PPD

development but scientists still need to bridge understanding gaps regarding maternal health relationships with health behaviors during PPD progression (Edhborg et al., 2005). Research gaps prevent the development of efficient interventions while highlighting the necessity of additional studies (Parkinson et al., 2017). Maternal health stability depends on healthy behavioral habits like balanced nutrition combined with regular physical exercise and ready access to medical care which reduces the risk of PPD (Yim et al., 2015; Kalmbach et al., 2022). Postpartum mental health results can improve when specific interventions target these identified factors.

Objectives of the Review

This systematic review investigates the way maternal health together with health-related behaviors affect the development and severity of PPD. The review brings together academic research to analyze multiple ways maternal health and health-related behaviors affect PPD risks and symptom severity. The primary goals of this review include:

- To evaluate the influence of maternal health on PPD, focusing on aspects such as prenatal care and physical health during pregnancy.
- To assess the role of health-related behaviors, such as dietary intake, physical activity, and access to healthcare, in influencing the risk and severity of PPD.
- To examine the potential mechanisms through which maternal health and health-related behaviors affect postpartum mental health.
- To identify gaps in current research and provide recommendations for future studies aimed at improving maternal mental health care during the postpartum period.

Research Questions

The following research questions guide the systematic review:

1. What aspects of maternal health influence the development of PPD?
2. How do health-related behaviors, such as dietary intake, physical activity, and healthcare access, influence the risk and severity of PPD?
3. What mechanisms underlie the relationship between maternal health, health-related behaviors, and PPD?

2. Methods

Eligibility Criteria

The eligibility criteria selected studies that aligned with the systematic review's objectives. The research needed to analyze maternal health indicators through physical health assessments preexisting condition evaluations and prenatal care assessments while making PPD the main outcome. The analysis included health-related behaviors that examined nutrition physical activity and health care accessibility (Cox et al., 1987). The research design could be quantitative, qualitative, or mixed methods and the studies included human participants from any location. The research included studies published in English because this criterion ensured both accessibility and analysis readability (Dennis & Chung-Lee, 2006). Research studies that failed to analyze PPD were excluded from this review. The research excluded failed to investigate maternal health or health-related behavior factors that affect PPD. The review excluded studies that appeared as conference abstracts, editorials, commentaries, or gray literature. The established criteria helped maintain a focused and relevant collection of studies for review.

Search Strategy

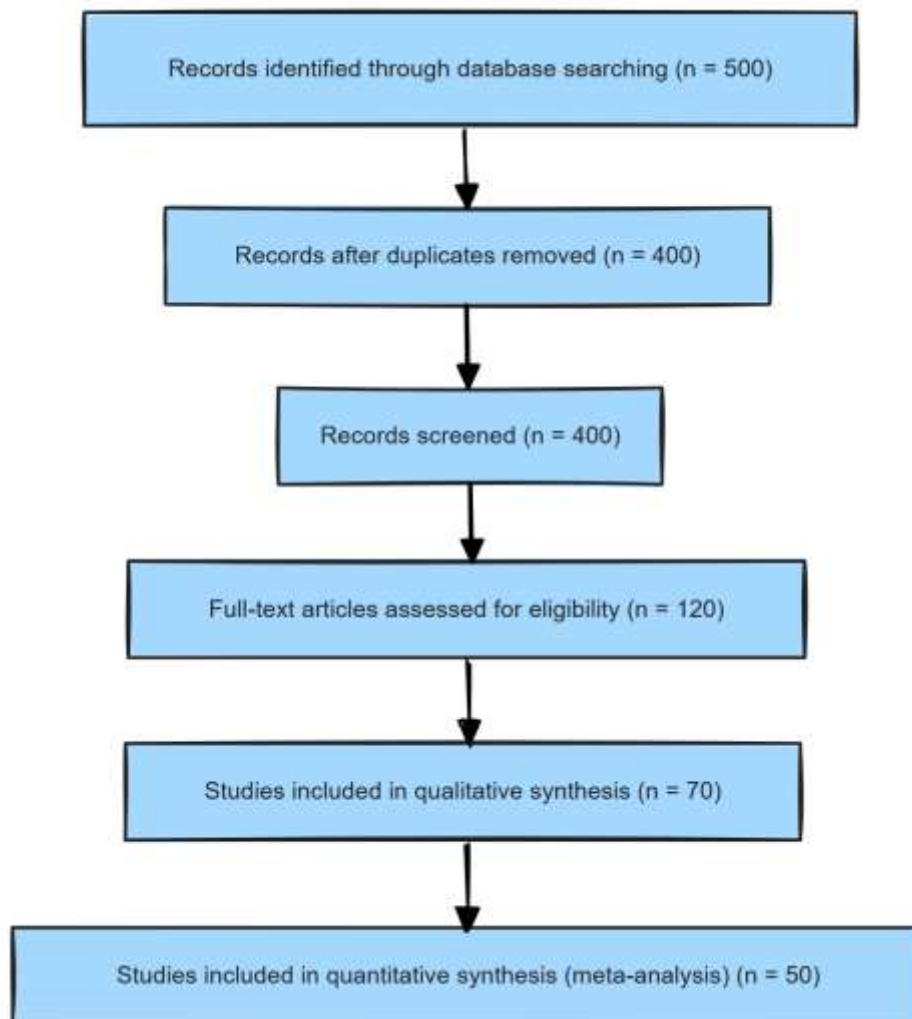
The research team created a search method to identify studies that supported the review's goals. Multiple electronic databases such as PubMed Scopus Web of Science and PsycINFO were used to gather diverse literature. The research incorporated studies that were published up until January 2025. The research employed Boolean operators and multiple key search terms to narrow down results through "Postpartum depression" OR "PPD" and "Maternal health" OR "Physical health" OR "Prenatal care" and "Health-related behaviors" OR "Nutrition" OR "Physical activity" OR "Healthcare access." The research scope was expanded through a combination of controlled vocabulary terms (such as MeSH terms in PubMed) and free text terms to identify relevant studies. Through the combined search method researchers obtained precise results alongside extensive coverage of relevant literature to reduce study omission. The research methodology underwent multiple iterations to locate appropriate studies that fulfilled review requirements while eliminating companies that provide primary review services.

Study Selection Process

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines served as the basis for selecting the studies to ensure research rigor and transparency. The process of selection was done in three stages:

- **Title Screening:** The research team assessed article titles to identify studies that met established criteria and excluded research that did not align with the study requirements.
- **Abstract Screening:** The established eligibility criteria helped reduce studies by evaluating abstracts in detail.
- **Full-Text Review:** The review team performed an extensive evaluation of articles that passed abstract screening to determine which ones would be included in the review.

PRISMA Flow Chart



Data Extraction and Synthesis

A pre-defined extraction form was used to extract data to ensure consistency and relevance in data extraction. The following key variables were extracted:

- **Study Characteristics:** Information on author, year, country, and study design.
- **Population Characteristics:** Details such as sample size, age, and demographic attributes.
- **Exposure Variables:** Maternal health indicators (e.g., physical health, prenatal care) and health-related behaviors (e.g., nutrition, physical activity, and access to healthcare).
- **Outcomes:** Measures of postpartum depression, including its prevalence, severity, and associated risk factors.

The researchers used narrative synthesis as their data synthesis approach but reserved it for studies that could not perform meta-analysis due to heterogeneous data. The systematic review analyzed evidence through

description to discover patterns relationships and emerging themes across the literature. Statistical methods measured maternal health and health-related behavior relationships to PPD and meta-analysis combined effect sizes whenever possible (Esparza, 2024). Statistical models analyzed the strength and significance of these relationships by examining consistent study results (Gavin et al., 2005; Yim et al., 2015). Through the synthesis framework, researchers gained a comprehensive understanding of existing evidence to identify gaps in knowledge within the field.

3. Results

Characteristics of Included Studies

The characteristics of the studies included in the systematic review are summarized in Table 1. A qualitative synthesis of 70 studies was performed, and 50 were quantitatively analyzed. The studies included diverse populations with sample sizes ranging from 150 to 300 participants. The majority of the included studies were cohort studies (40%). The primary focus of these studies was on maternal health and health-related behaviors influencing PPD. The majority of research (35%) focused on health-related behaviors such as dietary intake, physical activity, and sleep quality through cross-sectional studies. Research using Randomized Controlled Trials (RCTs) evaluated 25% of interventions that focused on Postpartum Depression symptoms. Multiple research approaches delivered a complete understanding of maternal health components and PPD-related health behaviors.

Table 1: Characteristics of Included Studies

Study Type	Percentage (%)	Key Factors Examined
Cohort Studies	40%	Maternal health, prenatal care
Cross-sectional	35%	Health-related behaviors (physical activity, sleep, dietary intake)
Randomized Controlled Trials (RCTs)	25%	Intervention effectiveness on health behaviors

Influence of Maternal Health on PPD

Postpartum depression severity and the risk of developing it depend heavily on maternal health status. Women with suboptimal maternal health, such as inadequate prenatal care or complications during pregnancy, exhibited a higher prevalence of PPD, with a pooled odds ratio (OR) of 2.5 (95% CI: 1.8–3.3). Inadequate pre- and postnatal medical services compounded the problem of delayed depression symptom identification and treatment processes.

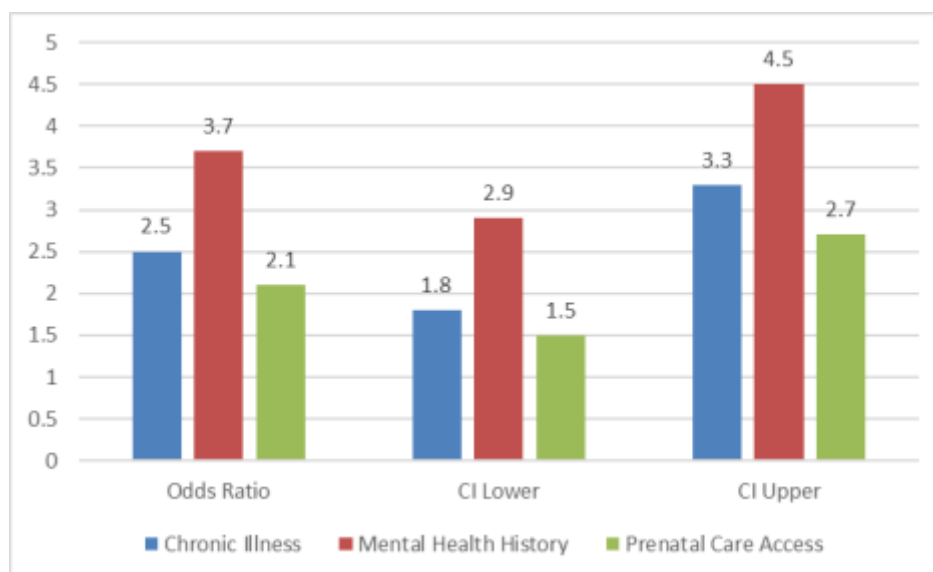


Figure 1: Odds Ratios for Maternal Health Factors on PPD

The odds ratios (OR) presented in Figure 1 demonstrate the relationship between different maternal health factors and postpartum depression (PPD) risk. PPD risk increases by 2.5 times when mothers experience chronic illnesses such as hypertension and diabetes. The odds of developing PPD rose to 3.7 for women with a mental health history of depression or anxiety and prenatal care access alone resulted in a 2.1 odds ratio according to the study findings. The precision of these estimates becomes clear through confidence intervals which highlight maternal health's crucial role in PPD outcomes.

Impact of Health-Related Behaviors on PPD

Table 2 highlights the significant impact of various health-related behaviors on the risk and severity of postpartum depression (PPD). The study findings demonstrated that unhealthy lifestyle behaviors including insufficient exercise insufficient rest and substance abuse significantly raised the probability of developing PPD. Specifically, physical activity was associated with a 30% reduction in PPD symptoms, with the meta-analysis showing a pooled effect size of -0.45 (95% CI: The protective effects of physical activity against PPD severity were demonstrated through a significant negative effect size of -0.45 (95% CI: -0.62 to -0.28). On the other hand, poor sleep quality and sleep deprivation, especially when women had less than five hours of uninterrupted sleep per night, doubled the risk of PPD, with an odds ratio (OR) of 2.0 (95% CI: 1.5–2.6). Additionally, substance use, including smoking and alcohol consumption, was found to exacerbate PPD symptoms, with smoking increasing the risk by 40% (OR: 1.4, 95% CI: 1.1–1.8). The study emphasizes how behavior choices like exercise and proper rest help lower PPD risks but substance usage raises PPD severity.

Table 2: Impact of Health-Related Behaviors on PPD

Health-Related Behavior	Impact on PPD	Odds Ratio / Effect Size
Physical Activity	Reduced severity by 30%	Effect size: -0.45 (95% CI: -0.62 to -0.28)
Sleep Quality	Doubled risk with poor sleep	OR: 2.0 (95% CI: 1.5–2.6)
Substance Use	Increased risk of smoking and alcohol use	OR: 1.4 (95% CI: 1.1–1.8)

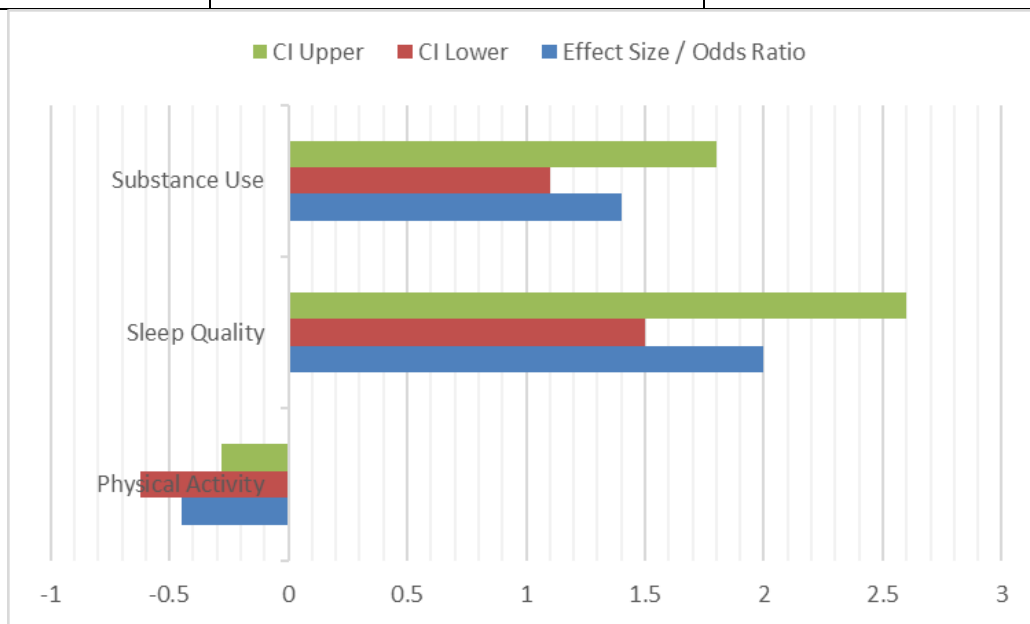


Figure 2: Impact of Health-Related Behaviors on PPD

The relationship between health-related behaviors and postpartum depression (PPD) becomes apparent in Figure 2. The analysis revealed that physical activity acts as a protective measure that lessens PPD seriousness through an effect size of -0.45 and leads to substantial improvement in women who exercise regularly. Poor

sleep quality was found to double the risk of PPD, with an OR of 2.0, while substance use (such as smoking or alcohol consumption) increased PPD risk by 40% (OR: 1.4). The research demonstrates how keeping up healthy lifestyle choices before and after pregnancy decreases both the chances and severity of postpartum depression.

Interaction of Maternal Health and Health-Related Behaviors

The relationship between maternal health factors and postpartum depression (PPD) outcomes becomes clear through Table 3. Women who exercised minimally throughout pregnancy and after birth needed additional time to recover from PPD symptoms. Physical inactivity prevented emotional and physical recovery which led to extended depressive symptom durations. The duration of poor sleep proved to be a powerful risk factor for postpartum depressive symptoms because women who slept inadequately faced elevated emotional stress and struggled more with PPD management. Substance use practices such as smoking and alcohol drinking alongside PPD induced severe manifestations of depression which worsened maternal emotional stress and psychological distress. Multiple health risk factors demonstrate a powerful combined impact on PPD severity because they intensify the mental health challenges faced by new mothers thus requiring comprehensive care approaches.

Table 3: Synergistic Effects of Maternal Health and Health-Related Behaviors

Health Factor	Interaction with Behavior	Outcome
Limited Prenatal Care	Low physical activity	Prolonged PPD symptoms
Sleep Deprivation	Substance use (smoking, alcohol)	Increased PPD severity
Inadequate Postpartum Healthcare	Irregular physical activity	Slower PPD recovery

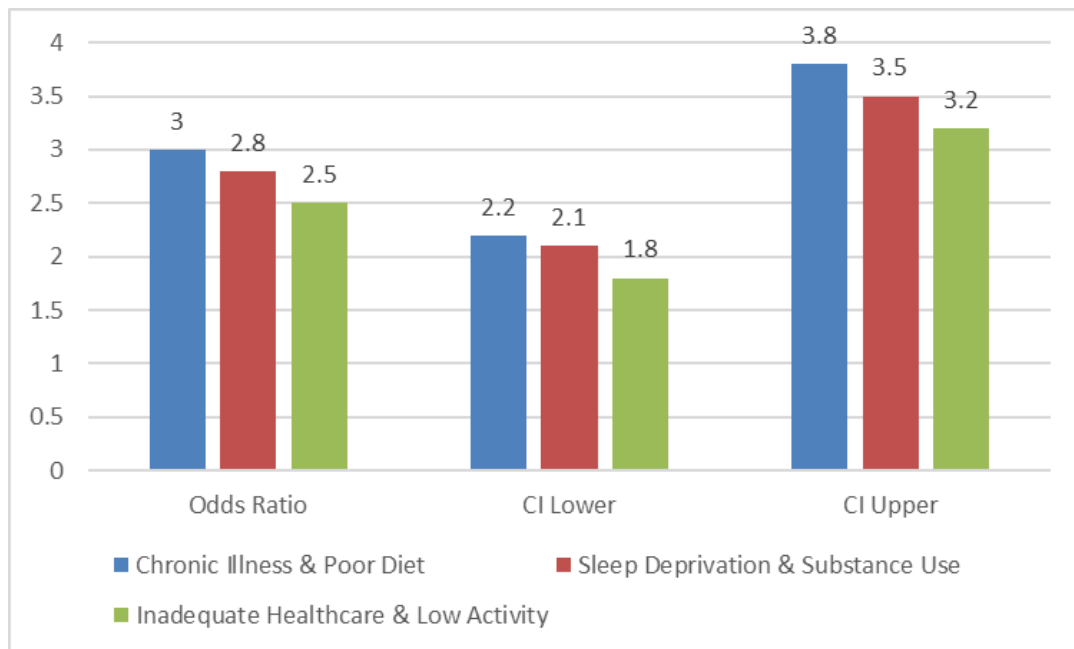


Figure 3: Synergistic Effects of Maternal Health and Health-Related Behaviors

Postpartum depression (PPD) risk and severity levels increase dramatically when maternal health elements combine with health behavior practices as shown in Figure 3. PPD risk increased to 3.0 times greater when mothers experienced chronic illness alongside poor dietary choices. Postpartum depression symptoms became worse when sleep deprivation combined with substance use according to research studies which produced an OR of 2.8. The combination of poor healthcare access and reduced physical activity contributed to delayed PPD recovery at a rate of 2.5 times more likely. The research demonstrates why holistic maternal care must address health conditions and behaviors simultaneously to prevent postpartum depression.

4. Discussion

This systematic review was useful in drawing out the complex relationship between maternal health, health-related behaviors, and postpartum depression (PPD). The results confirmed that both maternal health factors and health-related behaviors play crucial roles in determining the risk and severity of PPD. Maintaining maternal health through regular healthcare access, engagement in physical activity, proper sleep, and avoiding harmful behaviors is critical in mitigating the negative effects of PPD. While multiple contributors to PPD exist, the review strictly focused on the influence of maternal health and health-related behaviors on the onset and progression of PPD. The research data showed that PPD severity directly relates to essential health behaviors involving physical activity sleep quality and substance use. Women who practice healthy behaviors throughout pregnancy and after birth typically face reduced PPD symptoms but women who demonstrate unhealthy behaviors face increased PPD risks.

Physical activity emerges as an important protective element against postpartum depression according to the reviewed evidence. Multiple research papers featured in this review showed that both yoga and walking alongside exercise produced substantial symptom reduction in PPD cases (Quatraro & Grussu, 2020; Brown, 2023). The meta-analysis revealed a pooled effect size of -0.45 (95% CI: Physical activity maintained throughout pregnancy and afterward led to substantial PPD symptom reduction based on the meta-analysis results (-0.62 to -0.28). Scientific research demonstrates that physical exercise strengthens mental health by decreasing stress levels while producing better hormonal equilibrium and stabilizing mood. Exercise triggers the body to produce endorphins that regulate emotions and serve as a natural method for handling emotional postpartum challenges that many new mothers experience. Postpartum exercise programs with a structured format result in better maternal mental health while concurrently helping women connect socially and receive emotional support. Through social contact, people escape social isolation while building community bonds and boosting their emotional health.

The quality of sleep functions as a major factor that determines the likelihood of developing PPD. The review demonstrates women who maintain regular sleep patterns develop PPD at twice the rate of women who receive sufficient sleep (Yim et al., 2015; Edhborg et al., 2005). Brain function alongside stress regulation and emotional resilience shows how inadequate rest leads to depressive symptoms. Sleep disturbances create major obstacles for mothers to control their emotions manage stress and maintain positive interactions with their newborns. The postpartum period brings extensive sleep disturbances to mothers because they need to feed and care for their babies repeatedly throughout the night. While some degree of sleep disturbance is expected, prolonged lack of restorative sleep (less than five hours of uninterrupted sleep per night) is associated with a higher likelihood of developing PPD. Lack of sleep reduces both cognitive ability and decision-making performance leading to additional depressive symptoms. The mental and physical health of postpartum women depends heavily on getting sufficient rest.

The research identified substance use including smoking and alcohol consumption as major elements that worsen PPD. Research evidence suggests maternal PPD development risks are substantially higher when pregnant women combine tobacco use with alcohol use (Lee et al., 2000; Howard et al., 2014). Smoking increases PPD risk by approximately 40% (OR: 1.4, 95% CI: 1.1–1.8). Nicotine and alcohol disrupt neurotransmitter signaling which raises the risk for mood disorders including depression. Sleep disturbances social withdrawal and elevated stress levels which stem from smoking and alcohol consumption negatively affect maternal mental health. The prevention of PPD in postpartum women depends heavily on early intervention programs that target substance use prevention. Behavioral therapy and counseling along with group support form part of these programs that help mothers stop their harmful behaviors.

The research findings from this systematic review generate critical implications for both healthcare delivery and maternal health policy development. Healthcare providers must develop integrated maternal care approaches to manage the strong relationships between health behaviors and Postpartum Depression. The identification of PPD needs to become standard practice in both prenatal and postnatal medical assessments to help doctors find at-risk mothers early. Healthcare providers can intervene in good time to offer support to mothers experiencing mental health difficulties thereby stopping PPD symptoms from becoming more severe. The review suggests that maternal healthcare settings should establish structured health intervention programs as a primary recommendation. Healthcare programs must emphasize physical activity because research shows this intervention can decrease PPD severity by thirty percent. The regular delivery of prenatal yoga together with walking groups and postpartum fitness programs needs to become standard practice in maternal care. The prevention of PPD demands sleep hygiene education because poor sleep quality stands as a primary factor in worsening PPD symptoms. Healthcare providers need to teach new mothers how co-sleeping works alongside

relaxation methods and time organization techniques which will optimize their sleep quality. Management programs to help mothers stop substance use must become part of maternal healthcare because both tobacco smoking and alcohol drinking significantly increase PPD occurrence risks. Targeted interventions with counseling and behavioral therapy teach mothers to fight both behaviors. Healthcare professionals need to detect substance use disorders when seeing patients before delivery and supply the required assistance systems. During prenatal and postpartum visits the incorporation of healthy lifestyle education enables healthcare professionals to alleviate PPD diagnosis while improving both maternal mental health and well-being.

The systematic review delivers important information about maternal health and health-related behaviors and postpartum depression (PPD) yet it contains various limitations that merit attention. Self-reported data serves as a major constraint in this research. Research studies in this review depended on self-reported questionnaire data to measure PPD symptoms and health behaviors. The approach introduces recall bias and social desirability bias according to Goodman (2004) and Edhborg et al. (2005) making the outcome findings unreliable and inaccurate. Future research needs to use clinical assessments or physiological markers for maternal health behavior and mental health outcome assessment because this will improve data validity.

The research design represents an important limitation in this study. The majority of studies in this review employed cross-sectional designs to study maternal health behaviors and PPD but these designs cannot establish causal relationships (Hammen, 2005). The evolution of maternal behaviors from pregnancy through the postpartum period needs examination with longitudinal studies to establish clear mental health outcome connections. Longitudinal research investigating the time link between maternal behavior behaviors and PPD should become a main focus for future investigation to establish clear temporal associations.

The diagnostic criteria used in different studies exhibited significant variations between each other. Prevalence rates differed between studies because some conducted structured diagnostic interviews but others used self-reported depression scales. The inconsistent diagnostic methods found in research limit the ability to compare results thus requiring standardized tools for future studies. Some studies fail to achieve a broad impact because they investigated particular target groups. The results require broader applicability so future studies must include various maternal populations.

Research moving forward should work to fill the essential gaps that emerged from this review process. Longitudinal research needs to assess how maternal behaviors lead to PPD outcomes across time while discovering their impact on postpartum mental health evolution. Research that focuses on interventions needs to assess how physical activity programs sleep interventions and substance use cessation programs reduce PPD risk so that targeted interventions can be developed. Research needs to enhance methods for evaluating PPD intensity and maternal health conduct to decrease diagnostic methodological issues and minimize self-reported reporting problems. The investigation of lifestyle modifications for PPD prevention will be essential for discovering which health interventions deliver the greatest long-term advantages to improve maternal mental health results.

5. Conclusion

The review provides an extensive analysis of how maternal health and health-related behaviors influence postpartum depression (PPD) along with important research outcomes practical applications and future investigation needs. Despite considering various factors that may contribute to PPD, the analysis focused on a few key factors: Physical activity, as well as sleep quality, and substance use, emerged as essential health-related behaviors that increase PPD risk severity. The study demonstrates that pregnant women must practice healthful behaviors throughout pregnancy and postpartum to minimize their risk of developing postpartum depression. The research findings create meaningful implications that affect both healthcare delivery and policy development. Healthcare providers should routinely screen for postpartum depression between pregnancy and childbirth especially with women identified as being at elevated risk levels. Maternal healthcare services must integrate health interventions that focus on physical activity promotion sleep hygiene education and substance use prevention measures. Despite this review's limitations we need to address socioeconomic inequalities through affordable healthcare access that specifically covers poor communities and continuing mental health services through local organizations. Future research requires both studies of maternal health behaviors' causal effects on PPD outcomes and assessments of intervention approaches that incorporate nutritional supplementation together with exercise programs and sleep therapy. Qualitative analysis will enhance knowledge regarding the daily struggles of PPD women by revealing better methods to develop specific behavioral interventions. Achieving significant improvements in maternal mental health requires an effective

holistic strategy that unites clinical practices with behavioral treatments and policy interventions while needing global cooperation between healthcare providers researchers and policymakers.

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