

## Original Research

# Bibliometric Analysis on Antenatal Depression: A Comparison of Research between Web of Science and China National Knowledge Infrastructure

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Academic Editor: Michael H. Dahan

Submitted: 27 May 2022 Revised: 13 September 2022 Accepted: 15 September 2022 Published: 16 January 2023

## Abstract

**Background:** Antenatal depression (AD) has adverse effects on mothers and children. While pregnant women in China are given less attention in terms of their mental health, in contrast, AD has resulted in increased interest at the international level. **Methods:** This study reviewed 1881 studies on AD from the Web of Science (WOS) and China National Knowledge Infrastructure (CNKI), using the bibliometric method in CiteSpace, to systematically analyze the research status, research hotspot, and potential trends of research on AD in China and abroad. **Results:** The results showed that: (1) There are 511 papers from the United States, followed by 210 from England, 136 from Australia, and 116 from Canada. Furthermore, articles from these four countries have the highest influence. And that the quantity and influence of papers published in China are relatively low; (2) Institution with the most publications is located in England, and those with the most influence are located in Australia and the United States; there are few Chinese institutions that publish on AD; (3) Literature on WOS clustered 7 hot topics, while documents on CNKI clustered 6, with similarities and differences; (4) With the passage of time, the researches of AD on CNKI gradually focused on the investigation and intervention of specific groups, while researches on WOS tend to consistently explore the biological and psychological mechanism and variety of intervention measures. **Conclusions:** It is the goal of China's research to further explore the mechanisms and influencing factors of AD in order to better implement diversified interventions and improve the quality of life for mothers with AD and their offspring.

**Keywords:** antenatal depression; CiteSpace; bibliometric method

## 1. Introduction

Antenatal depression (AD) is the most common mental disorder during pregnancy and is characterized by a number of symptoms, including, but not limited to, feelings of sadness, changes in sleeping patterns, loss of energy, loss of interest, thoughts of suicide, most of the day, nearly every day, for at least two consecutive weeks [1]. Women with AD are at higher risk for substance abuse, preeclampsia, edema, premature rupture of membranes, hemorrhage, and severe headaches. AD can not only result in preterm birth or low birth weight, but also has a persistent adverse impact on the neurological, behavioral, and emotional development of the offspring of AD mothers [2,3]. Furthermore, AD is also associated with postnatal depression [4]. Although anti-depressant medication has a curative effect on moderate to severe AD, the treatment tends to be discontinued since women often feel worried about the side effects on the development of the fetus [5,6]. Psychosocial and psychological interventions are usually studied as the prevention and treatment of AD [7,8]. Extensive research at the international level is being conducted on AD-related influencing factors and treatment methods for improving the mental health of pregnant women.

A systematic review and meta-analysis conducted in developed countries showed the prevalence of depression to be 7.4%, 12.8%, and 12% at the first, second, and third trimesters of pregnancy, respectively [9]. AD is higher in low-income countries and is associated with maternal and psychosocial factors [10]. It is estimated that 19.7% [11] of pregnant women in China are affected by AD, and maybe even higher as it is often missed, since women may consider depression as usual response to pregnancy. In general, the number of medical papers from China has increased significantly; for example, in publications on general Obstetrics and Gynecology, papers from China account for 6.2%, indicating that China's medical science has a considerable impact on worldwide medicine [12]. In terms of pregnancy-related mental/psychological disorders, especially AD, China plays a relatively small role. Pregnant women and doctors in China tend to place a greater emphasis on their physical health than on their mental health [13]. In contrast, a great deal of research has been conducted on mental illness during pregnancy at an international level, particularly in developed countries.

Comparing the literature reviews of AD in the China National Knowledge Infrastructure (CNKI) and Web of Science (WOS) allows us to identify differences in the re-



search status, characteristics, and development of this field in different backgrounds, and identify the shortcomings of Chinese research. CiteSpace software CiteSpace software (version 5.6. R2) developed by Chen (Drexel University, Philadelphia, PA, USA) combines the theories of applied mathematics, graphics, information visualization technology, and bibliometrics to draw a visualized knowledge map, and can vividly show the discipline structure, development history, frontier fields, and overall knowledge architecture, and provide a valuable reference for researchers to evaluate discipline literature and predict frontier development [14]. Bibliometrics tools can enhance the objectivity and credibility of research conclusions [15].

This study used bibliometrics and CiteSpace software to comprehensively analyze the AD literature from CNKI and WOS, and conduct a network analysis of their annual publication counts, highly cited studies, research institutions, and literature keywords to compare the development status and research hotspots and trends of AD in CNKI and WOS. We here picked up China's situation but this data might be generalizable; doctors in developing countries tend to first look at "physical" condition and "mental second". This tendency may be a universal phenomenon. Thus, the present data, in a sense, reflect the condition of developing countries other than China as well and thus have generalization. Our study will therefore provide a reference for future research in China as well as other developing countries.

## 2. Materials and Methods

### 2.1 Data Source

WOS is the largest and most comprehensive academic information resource in the world, and includes the most influential core academic journals in natural science, engineering technology, biomedicine, and other research fields. CNKI is the largest dynamically updated full-text database of Chinese academic journals in the world. The content covers natural science, engineering technology, agriculture, philosophy, medicine, humanities, social sciences, and other fields. One can retrieve all the authoritative literature in Chinese and English through these two databases. The time span was from the library creation to December 22, 2021. The Web of Science search strategy was determined as: TS = (depression OR depress\*) OR AB = depress\*) and AB = (antepartum OR ante-partum OR prenatal OR pre-natal OR antenatal OR ante-natal OR pregnan\* OR prepartum OR pre-partum); the CNKI search strategy was: (SU = chanqian yiyu) OR (SU = reshengqi yiyu) OR (SU = yunqi yiyu). Inclusion criteria include: publicly published, subject-matched, and database-included literature. Exclusion criteria are: unrelated or weakly relevant research literature; articles with missing fields such as author, keywords, units, etc.; duplicate publications; books, information, conference papers, etc.

### 2.2 Data Processing

After importing all the retrieved literature into Note-Express literature management software for removing duplicate literature, two master's degree students (with research interests in gynecological nursing) performed manual screening by reading the titles and abstracts. If they could not be identified through the titles and abstracts, they read the full text and made a judgment, asking experts to rule if necessary. Literature with obvious quality problems was also excluded in order to reduce deviations in research results. Rather than strictly following the standards of various types of literature quality evaluation tools, we determine whether an article has obvious quality defects by reviewing a few basic items. Among the questions to be answered are: Is there an appropriate method of selecting the research subjects, and is the sample size sufficient? Is the data analysis method appropriate? Are the interventions, treatments, or diagnostic assessments clearly described? Did the groups receive the same measures in addition to the intervention as part of the intervention study? Some articles that are obviously low-quality are eliminated. During this process, two master researchers are also involved, and a third person is requested to act as an arbitrator if disagreements arise.

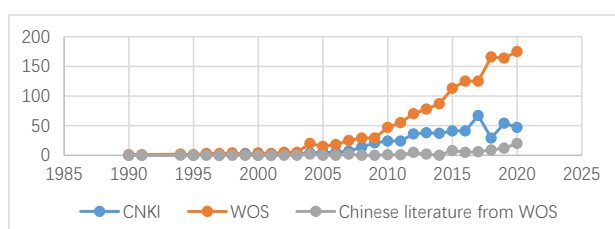
The literature that was irrelevant or of low quality was eliminated. Finally, we included 1374 articles from the Web of Science and 507 articles from CNKI. The literature data were saved to the Input folder with the name download\_\*.text. After converting the data format using CiteSpace, the authors, institutions, and keywords were selected for visual analysis of the literature, respectively. Parameter settings: Time Slicing (Time Slicing) for library creation—December 2021 (WOS) and library creation—December 2021, one partition per 1 year. Extraction node threshold selection (Selection Criterion): Top N Per Slice (N = 50); network clipping selection critical path method (Pathfinder). The authors, title, abstract, keywords countries, and institutions were all included for each study. In the visualization map drawn by CiteSpace, the radius of the circle represents the number of papers published in the country/institution map; the connection between the rings indicates a cooperative relationship between them; the color of the circle represents different years, from cool to warm, purple represents the earlier year, yellow represents the latest year; centrality refers to the ability of countries, institutions, and keywords as media, which is used to measure the importance of contribution, nodes whose centrality value exceeds 0.1 are called key nodes [16,17].

## 3. Results of Literature Analysis

### 3.1 Overview of AD Studies from WOS and CNKI

The annual number of publications can, to a certain extent, reflect the change in research heat in the field. Fig. 1 shows that the first study on AD in WOS was published in

1990. In the early stage, this research did not attract much attention from international scholars, and only a few studies were published in the literature every year. From 2009 to 2020, the number increased from 29 to 175, with an average annual growth rate of 19.61%. It can be expected that more studies will appear in the future. The first article in China on AD was published in 1996. Han [18] published an article entitled “Investigation and analysis of depression during pregnancy”, which for the first time, explored the psychosocial risk factors of antenatal depression in China, and which attracted a lot of attention at that time. Fig. 1 shows that from 1996 to 2006, the number of studies on AD grew slowly, from 2006 to 2017, the number increased rapidly, with an average annual growth rate of 29.63%. Since then, the number of articles published decreased slightly, and the total number of papers is limited. It is worth mentioning that China has published more than 70 papers in WOS since 2004, indicating that they have begun to pay attention to international platforms.



**Fig. 1. Annual distribution of the studies from WOS and CNKI.**

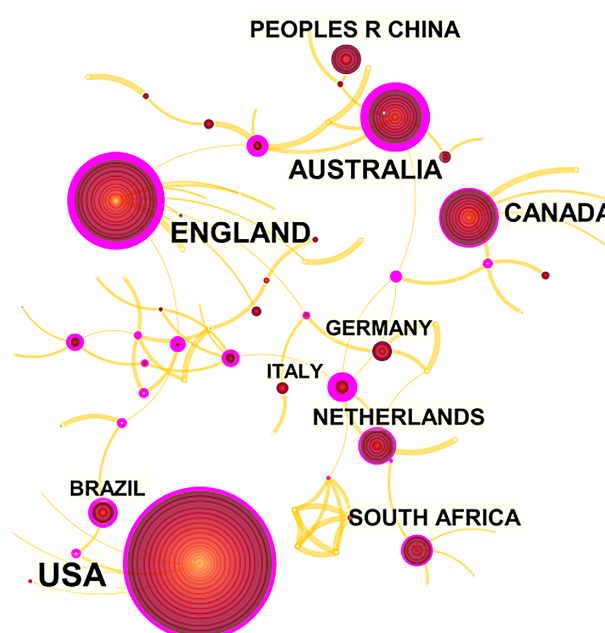
Literature co-citation is when two articles are cited by a third paper at the same time. These two papers then constitute a co-citation relationship, and the literature with the higher citation frequency has a higher academic influence in the field. CiteSpace software was used to analyze the literature co-citation of WOS data with Co-citation as the node. This enables us to see the distribution of research directions through the analysis of the most cited literature. Table 1 (Ref. [19–23]) lists important international studies related to AD from WOS. The five most highly-quoted articles mainly focus on three aspects: the influence factors, the relationship between antenatal and postnatal depression, and the influence of AD on offspring. Table 2 (Ref. [18,24–27]) lists the five most highly cited studies in CNKI, three of which discussed risk factors of AD, and the other two discussed the cutoffs of the AD screening scale and the relationship between antenatal and postnatal depression, respectively.

### 3.2 Quantitative Analysis of the Studies on AD

#### 3.2.1 Co-Country

The country/regional cooperation network mapping provides a visual representation of the volume of articles

published by each country within a research territory and the intensity of cooperation between countries. Run CiteSpace with country as the node used to draw the map. The national/regional cooperation network map includes 86 nodes and 235 lines, which means that AD-related studies came from at least 86 countries/regions. As shown in Fig. 2, the United States has the largest number of papers (511), accounting for 1/3 of the total number, followed by England (210), Australia (136), Canada (116), and China (73). In terms of centrality, the United States (0.56), England (0.43), Australia (0.20), and Canada (0.13) are still in the top four, indicating that their research results are worthy of reference by scholars from all over the world. However, the centrality score of Chinese literature is only 0.01, which has little influence, although it ranks fifth in the world, it only accounts for 5% of the total.



**Fig. 2. Co-countries of the studies on AD from WOS.**

#### 3.2.2 Co-Institute

Similar to Co-country, institution co-occurrence mapping can reflect the distribution of research efforts within a given country for that research area and the collaborative relationships between institutions. As shown in Fig. 3A, the five institutions with the largest number of papers on AD research from WOS are King’s College London (61), University of Oxford (35), University of Miami (32), Harvard University (32), and Emory University (30). The first two institutions are located in England, the rest in the United States, which shows that England has the institution with the most publications in the field. Although the University of Melbourne and Duke University do not publish the most papers, they have the greatest impact on other institutions,

**Table 1. Top 5 most highly-cited studies on AD from WOS.**

Title	Author	Journal	Citation count	Year
A Meta-analysis of Depression During Pregnancy and the Risk of Preterm Birth, Low Birth Weight, and Intrauterine Growth Restriction	Grote NK [19]	Nursing Research	1160	2010
Cohort study of depressed mood during pregnancy and after childbirth	Evans J [20]	British Medical Journal	811	2001
The course of anxiety and depression through pregnancy and the postpartum in a community sample	Heron J [21]	Journal Of Affective Disorders	687	2004
Effects of perinatal mental disorders on the fetus and child	Stein A [22]	Lancet	653	2014
Risk factors for depressive symptoms during pregnancy: a systematic review	Lancaster CA [23]	American Journal Of Obstetrics And Gynecology	543	2010

**Table 2. Top 5 most highly-cited studies on AD from CNKI.**

Title	Author	Journal	Citation count	Year
Study on the optimal critical value of the Edinburgh Postnatal Depression Scale in the screening of antenatal depression	Guo XJ [24]	Chinese Journal of Nursing	107	2009
The relationship between antenatal depression and postnatal depression of women in Chengdu City	Hu J [25]	Chinese Journal of Nursing	93	2009
Risk factors of prenatal depression and anxiety in pregnant women	Yang T [26]	Chinese Mental Health Journal	76	2015
Research status of prenatal depression	Li DC [27]	Chinese Mental Health Journal	56	2004
Investigation and analysis of depression during pregnancy	Han Q [18]	Chinese Mental Health Journal	55	1996

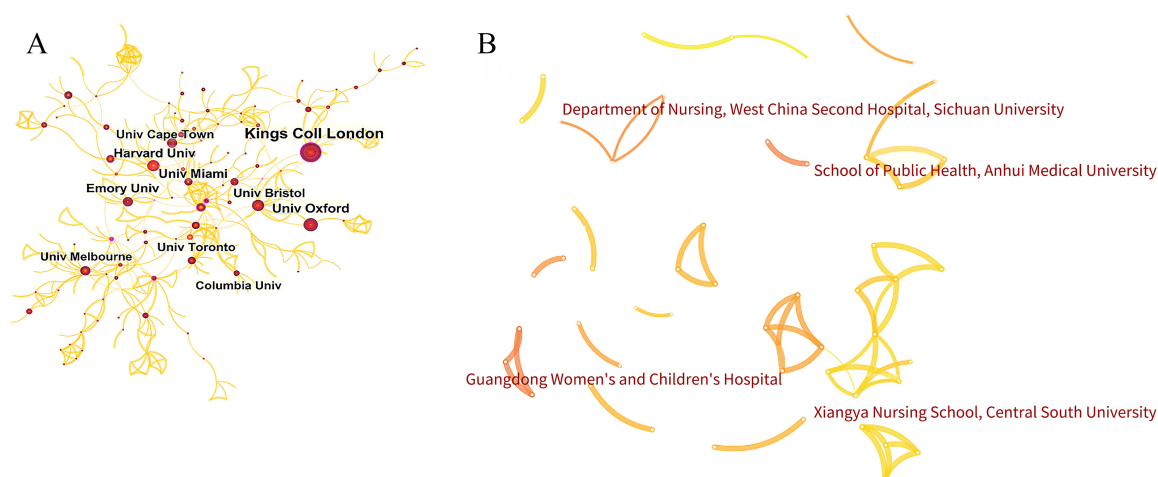
with a centrality of 0.10, followed by King's Coll London (0.09), Emory University (0.08), and Harvard University (0.06), which shows that Australia and the United States have the institutes with the most influence. However, the cooperation network density of AD-related research institutions is low (0.0097), and the institutions are relatively scattered, therefore, it will be necessary to strengthen cooperation.

As for AD research from CNKI, in Fig. 3B, Anhui Medical University ranks first in the number of published papers, but only seven papers, accounting for 1.4% of the total. The organization cooperation network diagram shows a low density (density = 0.0031) and the centrality of each institution is 0, indicating that the research strength in this field is extremely dispersed, with no aggregation or scaling effects, and that many institutions are not close enough and that there is a lack of cooperation consciousness.

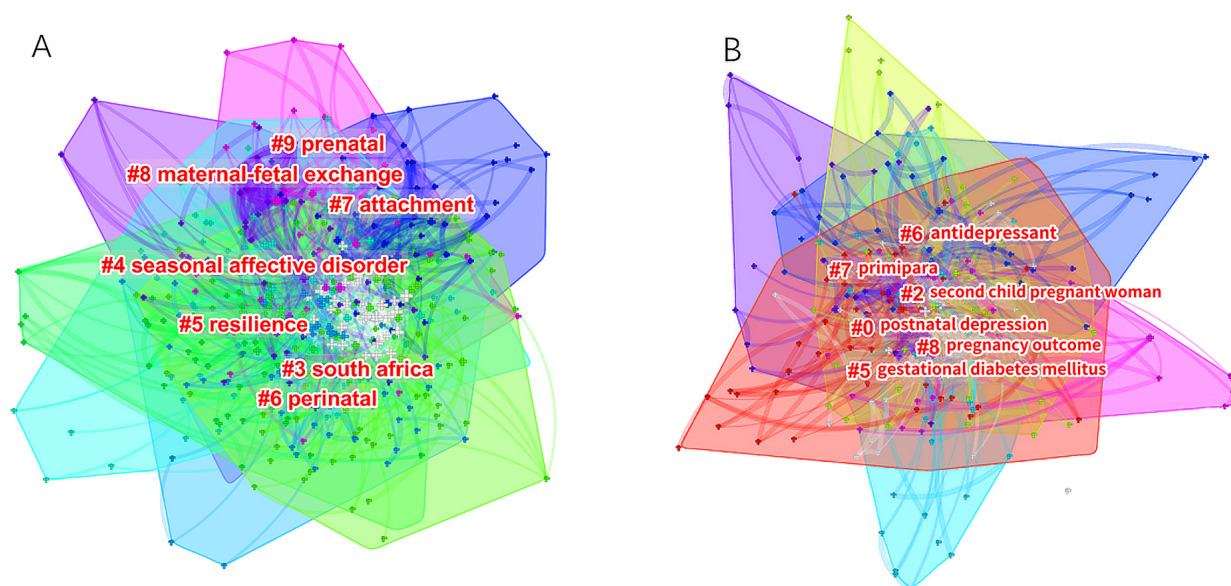
### 3.2.3 Cluster Map

A keyword cluster is the formation of a class cluster of closely related keywords, which can analyze the main research directions in the field and the key topics in that direction. For AD research from WOS, as shown in Fig. 4A, the LLR algorithm was used to cluster the keyword co-occurrence map. A larger cluster size indicates a larger number of keywords included, and it is generally accepted that silhouette value  $>0.7$  indicates good intra-cluster homogeneity. Therefore, 3 modules with a smaller cluster size of less than 10 and silhouette less than 0.7 are excluded, since they have no value to discuss. The remaining seven

hot topics are summarized in Table 3. They include domestic violence, complementary and alternative medicine therapies (CAM), risk and protective factors, psychological interventions, adverse offspring outcomes, drug intervention, and cytokines. The display of the keyword clustering network contains many overlapping clusters. Although there are differences among the studies, the topics are concentrated. For domestic violence, the cluster title is "South Africa". According to the main clusters identified, studies focused on exploring the impact of intimate partner violence (IPV), domestic violence, childhood abuse, and post-traumatic stress disorder on AD in South Africa. For CAM, the cluster title is "seasonal affective disorder". The main clusters identified suggest that studies examined the effect of CAM during pregnancy on AD intervention, such as yoga, aerobic exercise, bright light therapy, omega-3 fatty acids, and massage, and analyzed patient preferences for each of these therapies. For the risk and protective factors, the cluster title is "resilience". Studies identified in the main clusters focused on factors that affect AD, such as obesity, body mass index, personality, delivery mode, and their interactions. There is a growing body of research examining resilience as a mediating or moderating factor. For psychological interventions, the cluster title is "perinatal". According to the main clusters identified, studies focused on intervention studies to investigate the effects of cognitive behavioral therapy and interpersonal therapy. For adverse offspring outcomes, the cluster title is "attachment". The main clusters identified suggest that studies focused on the relationship between AD and maternal-infant attach-



**Fig. 3. Co-institutes of the studies.** (A) Co-institutes of the studies from WOS. (B) Co-institutes of the studies from CNKI.



**Fig. 4. Keywords clustering map.** (A) Keywords clustering map from WOS. (B) Keywords clustering map from CNKI.

ment patterns as well as infant development. For drug intervention, the cluster title is “maternal-fetal exchange”. In the main clusters identified, studies explored the effects of antidepressants on offspring and their mechanisms of action. For cytokine, the cluster title is “antenatal”. The main clusters identified suggest that studies focused on drug interventions often investigated the relationship between immune inflammatory response and other biomarkers on depression and its treatment.

For AD research from CNKI, as shown in Fig. 4B, after keyword clustering, four modules with smaller cluster size less than 10 and silhouette less than 0.7 are excluded, and the remaining six clustering research topics are summarized into six hotspot topics: health education, second child pregnant, gestational diabetes mellitus (GDM), drug intervention, screening, maternal adverse pregnancy outcomes,

as shown in Table 4. For health education, the cluster title is “postnatal depression”. The main clusters identified indicate that studies focused on preventing antenatal and postnatal depression through childbirth education, prenatal health education, and psychological support. For second child pregnant, the cluster title is “second child pregnant woman”. Among the main clusters identified, studies examined factors affecting depression among second-birth pregnant women and childbirth outcomes as a result of depression. For GDM, the cluster title is “gestational diabetes mellitus”. The prevalence of GDM has been increasing in the past few decades. The main clusters identified suggest that studies focused on examining depression levels in pregnant women with GDM, as well as the effects of nurse-led nursing clinics and maternity schools on depression in these pregnant women. For drug intervention, the cluster

**Table 3. Keyword clustering table of the literature from WOS.**

Cluster-ID	Size	Silhouette	Mean (Year)	Cluster Header	Main Cluster	Topic
#3	84	0.7	2014	South Africa	intimate partner violence, middle-income country, posttraumatic stress disorder, low income, South Africa, HIV, adverse childhood experience, abuse, domestic violence, sexual abuse, maltreatment, physical abuse	domestic violence
#4	77	0.736	2011	seasonal affective disorder	physical activity, yoga, alternative therapy, light therapy, controlled trial, efficacy, seasonal affective disorder, preference, quality of life	complementary and alternative medicine therapies
#5	63	0.701	2014	resilience	united states, obesity, socioeconomic status, social support, body mass index, resilience, cesarean section, age, personality	risk and protective factors
#6	60	0.747	2011	perinatal	EPDS, randomized controlled trial, interpersonal psychotherapy, cognitive behavioral therapy, prevention, psychotherapy, acceptability	psychological interventions
#7	54	0.777	2006	attachment	child development, behavior, infant, attachment, cognitive development, newborn, temperament, offspring, offspring depression	adverse offspring outcomes
#8	44	0.838	2012	maternal-fetal exchange	antidepressant, prenatal exposure, comorbidity, persistent pulmonary hypertension, birth defect, child health, breastfeeding	drug intervention
#9	40	0.795	2013	prenatal	major depression, prenatal, cytokine, inflammation, postnatal, c reactive protein, biomarker, immune system, necrosis factor alpha, increased risk, immune activation, polymorphism	cytokine

Cluster Header: the name of the cluster obtained by the software based on the relationship between the keywords within the cluster; Main Cluster: the representative keywords within each cluster; Topic: the research direction represented by the cluster.

title is “antidepressant”. The research in CNKI, similar to the research in WOS, the main clusters identified suggests that studies focused on exploring the effects of depression drugs on mothers and children. For screening, the cluster title is “primipara”. According to the main clusters identified, studies focused on utilizing the EPDS to screen for depression throughout pregnancy, as well as to confirm its reliability and validity, and determine an appropriate cutoff value based on the country’s actual situation. For maternal adverse pregnancy outcomes, the cluster title is “pregnancy outcome”. The main clusters identified suggest that studies focused on examining adverse pregnancy outcomes associated with AD, such as increased rates of cesarean deliveries, gestational hypertension, and labor pains.

### 3.2.4 Time Zone Map

The time zone algorithm is used to transform the keyword co-occurrence map according to the time distribution, and can clearly show the approaching process of knowledge. On the basis of keyword clustering, click on time zone to get the map. By analyzing the time zone map, the research hotspots and development trends of each period in this field can be displayed, and the possible research di-

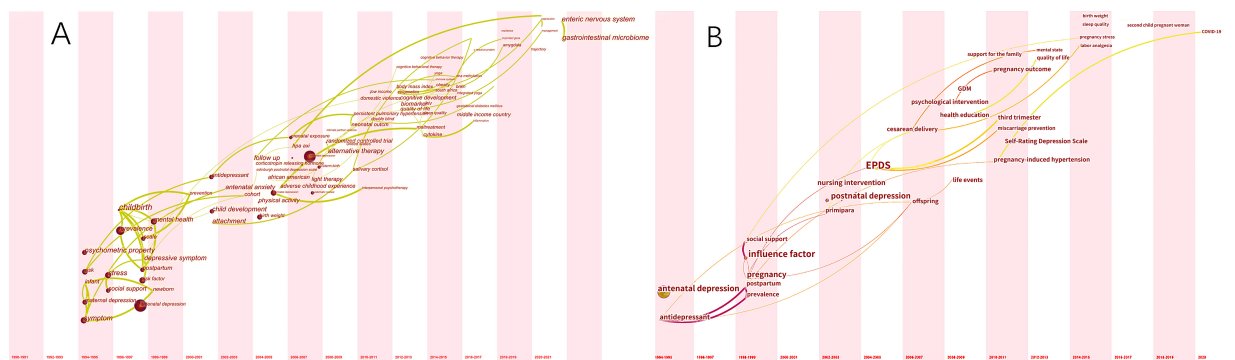
rections in the future can be predicted. The location of the circular node represents the year when the keyword first appears, and the larger the node, the higher the frequency of occurrence.

As shown in Fig. 5A and Table 5, the study of AD can be divided into three stages: the first stage is from 1994 to 2003, this phase of the study explored the measurement and influencing factors of AD, drug treatment and the impact of AD on offspring. The second stage is from 2004 to 2011, researchers have examined psychosocial factors and biological mechanisms of disease, as well as self-help interventions using complementary alternative therapies. The third stage is from 2012 to 2021, at this stage, the discussion on the biological mechanism is more comprehensive, and intervention research also begins to explore the prevention and treatment effect of professional psychotherapy on depression. In summary, the literature on WOS has gradually intensified and diversified in the exploration of mechanisms and methods of intervention.

As shown in Fig. 5B and Table 6, from 1994 to 2007, Chinese research focused on the measurement, drug treatment, and social psychological factors of AD. Then from 2008 to 2015, the research began to study depression in spe-

**Table 4. Keyword clustering table of the literature from CNKI.**

Cluster-ID	Size	Silhouette	Mean (Year)	Cluster Header	Main Cluster	Topic
#0	53	0.775	2013	postnatal depression	postpartum depression, psychological intervention, health education, quality of life, prevention, prenatal depression, delivery	health education
#2	44	0.723	2013	second child pregnant woman	Influencing factors, postpartum, second child pregnancy, social support, pregnancy pressure, coping style, postpartum hemorrhage, pregnancy complications	second child pregnant woman
#5	37	0.739	2013	gestational diabetes mellitus	nursing intervention, gestational diabetes mellitus, anxiety and depression, sleep quality, pregnant women school, nurse clinic, natural birth rate	gestational diabetes mellitus
#6	37	0.865	2012	antidepressant	antidepressants, offspring, incidence rate, neonatal, adverse outcomes, academic performance, attention deficit hyperactivity disorder	drug intervention
#7	33	0.915	2011	primipara	primipara, Edinburgh Postpartum Depression Scale, late pregnancy, screening, early pregnancy, reliability and validity analysis, cut-off value	screening
#8	30	0.73	2014	pregnancy outcome	pregnancy outcome, cesarean section, gestational hypertension, labor pain, mental health	maternal adverse pregnancy outcomes



**Fig. 5. Time zone atlas of keywords.** (A) Time zone atlas of keywords from WOS. (B) Time zone atlas of keywords from CNKI.

cial groups, such as GDM, and pregnancy-induced hypertension. Since 2016, studies began to explore the depression status of second-child pregnant women. Since the outbreak of COVID-19, Chinese researchers began to launch surveys and interventions on the effect of depression during pregnancy in Wuhan. In short, with the passage of time, the research of AD in China has gradually focused on the investigation and potential interventions in specific groups paying special attention to the problems faced by pregnant women, which greatly affects clinical outcomes.

#### 4. Discussion

In accordance with WHO's advocacy of "no health without mental health" [28], much attention should be given to improving maternal mental health. In this study, 1374 studies in WOS and 507 studies in CNKI were included, and a bibliometric analysis was conducted to compare the

current situation and potential trends of international and Chinese research on AD. Chinese research has several limitations in comparison to international research. The number of papers published in the field of AD in China is small, the cooperation between institutions is lacking, and the influence of literature is weak.

Studies in WOS have a more comprehensive and in-depth understanding of AD mechanisms. Although the possible pathogenesis of AD has been revealed from different perspectives, various hypotheses cannot explain all the causes of depression [29]. Research on WOS has extensively examined the pathogenesis and personalized treatment of depression based on the monoamine neurotransmitters and their receptors, HPA axis dysfunction, inflammation, and the gastrointestinal microbiome [30,31]. The in-depth investigation of the pathogenesis at the international level can be an important reference point for China. Chinese research should develop from a simplified single onset

**Table 5. Hot keywords in the time zone table from WOS.**

Mean (Year)	Keywords
1994–2003	psychometric property, prevalence, risk factor, infant, child development, antidepressant
2004–2011	HPA axis, corticotropin-releasing hormone, domestic violence, alternative therapy, intimate partner violence
2012–2021	CBT, cytokine, immune system, amygdala, gene, gastrointestinal microbiome

**Table 6. Hot keywords in the time zone table from CNKI.**

Mean (Year)	Keywords
1994–2007	antidepressant, influence factor, social support, nursing intervention, postnatal depression, primipara, EPDS, offspring
2008–2013	GDM, psychological intervention, health education, pregnancy-induced hypertension, pregnancy outcome
2014–2021	second child pregnant woman, COVID-19, sleep quality, pregnancy stress

model to a multi-system-linked overall evaluation model. It is anticipated that the discovery of relevant mechanisms will provide an important basis for research and development of new treatments for AD.

Compared to the literature on AD, the literature on WOS has more in-depth research on family-related factors. IPV is the psychosocial influencing factor that they are more concerned with. IPV is recognized as major public health and social problem globally. According to the World Health Organization, about 1/3 of women in the world have experienced physical and/or sexual violence with their intimate partners, in some areas, the proportion is as high as 38% [32]. Despite the increasing awareness of IPV worldwide, it has received little attention in China. Chinese society historically has been dominated by a strict patriarchal structure, and the ideas of female inferiority and male preference are still prevalent, particularly in rural areas [33]. Importantly, more research in China needs to be undertaken to investigate the prevalence of AD among women who have experienced IPV and to explore the association between IPV and depression.

Several studies in the WOS literature examine the mediating or moderating effects of factors such as resilience and social support on AD, as well as the interaction between different influencing factors [34,35]. Chinese research will be advanced by this concept. The identification of the relationship between the influencing factors and the exploration of intermediary factors, will enable researchers to develop clinical treatments and design psychological interventions based on the psychological characteristics of pregnant women. It is important for scholars to carefully control variables and eliminate interfering factors when preparing a research design. Individuals with normal psychological assessments and those who have been given a placebo can be used as control groups. Multivariate studies and longitudinal studies can be utilized to examine these results and draw causal conclusions.

According to the literature research on WOS, there has been considerable exploration of professional psychotherapy as well as CAM. Cognitive-behavioral therapy and Interpersonal psychotherapy are recommended as the first choice for the treatment of mild to moderate depression and

the most effective method for the prevention of perinatal depression, especially for individuals with a history of depression, lack of social support, unexpected pregnancy, and other risk factors [36,37]. There also may be a preference among pregnant persons for CAM, which can be used in the context of privacy and safety, with little or no potential adverse effects or risks [38]. Research on CNKI emphasizes health education, which is mainly carried out by nursing staff. A lack of mental health human resources is prevalent in China. Nurses in obstetrics and gynecology are likely to be the main source of intervention [39]. During clinical practice, nurses should conduct a comprehensive assessment of pregnant women with depression and determine the most effective treatment based on the severity of their condition and their personal preferences. Health education and promotion should be applied to all pregnant women as a universal intervention method, while professional psychotherapy should be considered an important treatment method for pregnant women with mild to moderate levels of depression. Therefore, exploring the intervention effect of professional psychotherapy implemented by non-psychiatric specialists in China should be the focus of future research.

The impact and effects of drug treatment in AD are widely discussed in the literature in both WOS and CNKI. Currently, there is limited information on the safety of antenatal antidepressants. On the one hand, scholars prefer psychotherapy to protect the health of pregnant women and their unborn children. On the other hand, many studies on safe drug use during pregnancy are based on observational data, which is difficult to resolve due to confounding and bias. It is imperative to conduct research on safe drug use, using more advanced statistical measurement methods, observing mothers and fetuses for a prolonged period of time following drug use, and examining the effects of drug treatment on the development of offspring during prenatal and adolescent life.

## 5. Conclusions

The number of papers published in the field of AD in China is small, the cooperation between institutions is lacking, and the influence of the literature is weak. In-depth re-

search on AD mechanisms and related influencing factors is lacking in China. The content of intervention research in China is also limited. Combined with China's national conditions and international experience, it will be necessary for China's research to extensively explore the mechanism and influencing factors for and to examine the implementation of diverse interventions to improve the quality of life for these patients and their offspring.

## Abbreviations

AD, antenatal depression; WOS, Web of Science; CNKI, China National Knowledge Infrastructure; CAM, alternative medicine therapies; IPV, intimate partner violence; GDM, gestational diabetes mellitus; EPDS, Edinburgh Postpartum Depression Scale.

## Author Contributions

YZ—design, hypothesis and writing of the article; QQW, JYM—data collection, data interpretation, GHX and HMW assistance with design and hypothesis, checking and approval of the final manuscript. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript.

## Ethics Approval and Consent to Participate

Not applicable.

## Acknowledgment

Not applicable.

## Funding

This project was supported by the National Natural Science Foundation of China (Grant No.: 72004102).

## Conflict of Interest

The authors declare no conflict of interest.

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