



Mental health outcomes across the reproductive life course among women with disabilities: a systematic review

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Abstract

Purpose This systematic review examined literature on mental health outcomes among women with disabilities living in high-income countries within the context of reproductive health, spanning menstruation through menopause.

Methods Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines, we searched MEDLINE, CINAHL, and PsycINFO databases for studies published through June 2023. Eligible studies were observational, quantitative, and included a comparison group without disabilities.

Results A total of 2,520 studies were evaluated and 27 studies met inclusion criteria. These studies assessed mental health during prepregnancy, pregnancy, postpartum, and parenting among women with and without disabilities. None of the studies examined reproductive health time periods related to menstruation, fertility, or menopause. Women of reproductive age with disabilities were more likely to have poor mental health outcomes compared to women without disabilities. During pregnancy and the postpartum, women with disabilities were at greater risk of diagnosed perinatal mental disorders and psychiatric-related healthcare visits. Findings also suggested mental distress and inadequate emotional and social support related to parenting among women with disabilities. The greatest risks of poor mental health outcomes were often observed among women with intellectual and developmental disabilities and among women with multiple types of disabilities, compared to women without disabilities.

Conclusions Routine reproductive healthcare visits provide significant prevention and treatment opportunities for poor mental health among women with disabilities. Further research examining mental health outcomes within the context of reproductive health, especially understudied areas of menstruation, fertility, parenting, and menopause, among women with disabilities is needed.

Keywords Mental health · Disability · Reproductive health · Pregnancy · Postpartum

Introduction

Women are approximately twice as likely as men to experience major depressive disorders and other mental health conditions throughout their lifetimes (Kuehner 2017; Li and Graham 2017). Differences in mental health outcomes between genders are first observed during puberty and continue beyond menopause into late adulthood (Kiely et al.

2019; Kuehner 2017). Factors that contribute to this gender gap include biological, physiological, behavioral, and cognitive influences of sex hormones (Li and Graham 2017), creating a strong link between mental and reproductive health in women. There has been growing awareness of mental health disorders related to menstruation, fertility, pregnancy, and menopause. A recent meta-analysis found a 13% greater risk of psychiatric admissions during the premenstrual phase and 17–26% greater risks of psychiatric admissions, suicide attempts, and suicide deaths during menstruation (Jang and Elfenbein 2019). Depression and anxiety disorders are highly prevalent among women with infertility (Chen et al. 2004; Williams et al. 2007) and are the most common pregnancy-related complications, affecting more than 12% of women (with many more women going undiagnosed) (Woody et al. 2017), with wide-ranging

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negative health consequences for both the mother and child (Cox et al. 2016; Luca et al. 2020; Runkle et al. 2023). Similarly, the menopausal transition has been associated with depression (Lewis Johnson et al. 2023), psychiatric symptoms (Hu et al. 2016), and disordered eating behaviors (Baker and Runfola 2016). It is critical to continue to understand associations between mental and reproductive health, with consideration for women who are at greater risk for health inequities.

In the United States (U.S.), disability is more common among women than men, especially during young and middle adulthood (Okoro et al. 2018). Approximately 18% of reproductive-aged women (18–44 years) and 30% of middle-aged women (45–64 years) report having at least one impairment related to vision, hearing, cognition, mobility, self-care, or independent living (Okoro et al. 2018). In addition to biomedical factors, women with disabilities are more likely to experience a range of social, structural, and personal risk factors for poor mental and reproductive health compared to women without disabilities, including living in low-income households, being less educated, engaging in unhealthy lifestyle behaviors (e.g., cigarette smoking), having chronic conditions (e.g., obesity), and suffering stressful life events (Deierlein et al. 2022; Horner-Johnson et al. 2021; Mitra et al. 2012, 2016; Tarasoff et al. 2020a, b, c). They are also more likely to experience barriers to health care access and availability, as well as discrimination within the healthcare setting, especially related to reproductive health care (Agaronnik et al. 2019; Alhusen et al. 2021; Dorsey Holliman et al. 2023; Matin et al. 2021; Mosher et al. 2017; Tarasoff 2017; Tarasoff et al. 2023a).

Literature on reproductive health among women with disabilities, particularly around the time of pregnancy, has been steadily increasing. Women with disabilities are more likely to enter pregnancy in worse health, experience complex reproductive health issues, such as severe morbidities, and have adverse infant outcomes compared to women without disabilities (Deierlein et al. 2021; Tarasoff et al. 2020b; Tarasoff, Ravindran, Tarasoff et al. 2020a, b, c). Given the inter-relationship between mental and reproductive health in the general population, and that women with disabilities are at greater risk for poor mental and reproductive health compared to their counterparts without disabilities, it is important to document the current research on this topic. Previous systematic reviews summarized findings on perinatal and infant health outcomes among women with disabilities (Deierlein et al. 2021; Tarasoff et al. 2020b; Tarasoff, Ravindran, Tarasoff et al. 2020a, b, c), yet mental health related to this time period has not been reviewed. Our objective was to describe current literature examining mental health outcomes among women with disabilities within the context of reproductive health, spanning menstruation,

prepregnancy, fertility, pregnancy, postpartum, parenting, and menopause. The findings are intended to inform future research needs and the development of prevention and treatment strategies.

Methods

We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 Guidelines and Checklist (Page et al. 2021). Three electronic databases, MEDLINE, Cumulative Index to Nursing and Allied Health Literature, and PsycInfo, were searched from inception through June 30, 2023. We adapted a search strategy developed by Walsh et al. (Walsh et al. 2014) with assistance from a research librarian. Search terms included Medical Subject Headings (MeSH terms) and key words related to disability, mental health, and reproductive health (Supplementary Table 1). Studies that met inclusion criteria were peer-reviewed, original research, written in English; collected quantitative data from persons with disabilities and included a comparison group without disabilities; and assessed mental health outcomes during a reproductive health time period of menstruation, prepregnancy (non-pregnant, reproductive-aged populations), fertility, pregnancy, postpartum, parenting, and/or menopause. We included studies that characterized their populations as having any type of disability or a physical, sensory, or intellectual and developmental disability (IDD) based on self-reported measures, assessments, or medical diagnoses associated with disability risk. Mental health outcomes were defined as self-reported, screened, or diagnosed mental health-related conditions (e.g., depression, anxiety), mental health care-related visits (e.g., emergency department visits, hospital admissions), or experiences related to mental health (e.g., survey questions about care). Articles were excluded if they only collected data from women with mental health disabilities; only reported on mental health outcomes as part of population characteristics; or were conducted in low- or middle- income countries (defined by World Bank classifications (World Bank 2023), due to potential differences in healthcare). This review was registered in PROSPERO (CRD42023470186).

Covidence systematic review software was used to screen and review all studies identified from searches. Two authors (NP, CP) independently screened titles and abstracts and reviewed full-text articles. Any discrepancies during the screening or review processes were resolved by discussion with a third author (ALD). References from included studies were hand-searched to identify any potentially missed studies from the original search. Data were independently extracted by two authors (NP, CP) and data extraction was

reviewed for completeness by other authors (ALD, RG). Extracted information included: study period and setting, study design, sample size, disability definition, reproductive health time period, mental health outcome(s), statistical analyses, and study findings. Study quality was assessed using the Effective Public Health Practice Project Quality Assessment Tool (Armijo-Olivo et al. 2012; Thomas et al. 2004). This is a validated tool for assessment of public health research that has been used in previous reviews of disability and health (Salaeva et al. 2020; Tarasoff et al. 2020b; Tarasoff, Ravindran, Tarasoff et al. 2020a, b, c). It provides global ratings of strong, moderate, or weak for studies based on selection bias, study design, confounding, blinding, data collection methods, attrition, and analyses. Two authors (NP, CP, RG) independently rated each study and any discrepancies were resolved by discussion with a third author (ALD). We did not perform a meta-analysis because there was considerable heterogeneity in study populations, exposure and outcome measures, and statistical analyses.

Results

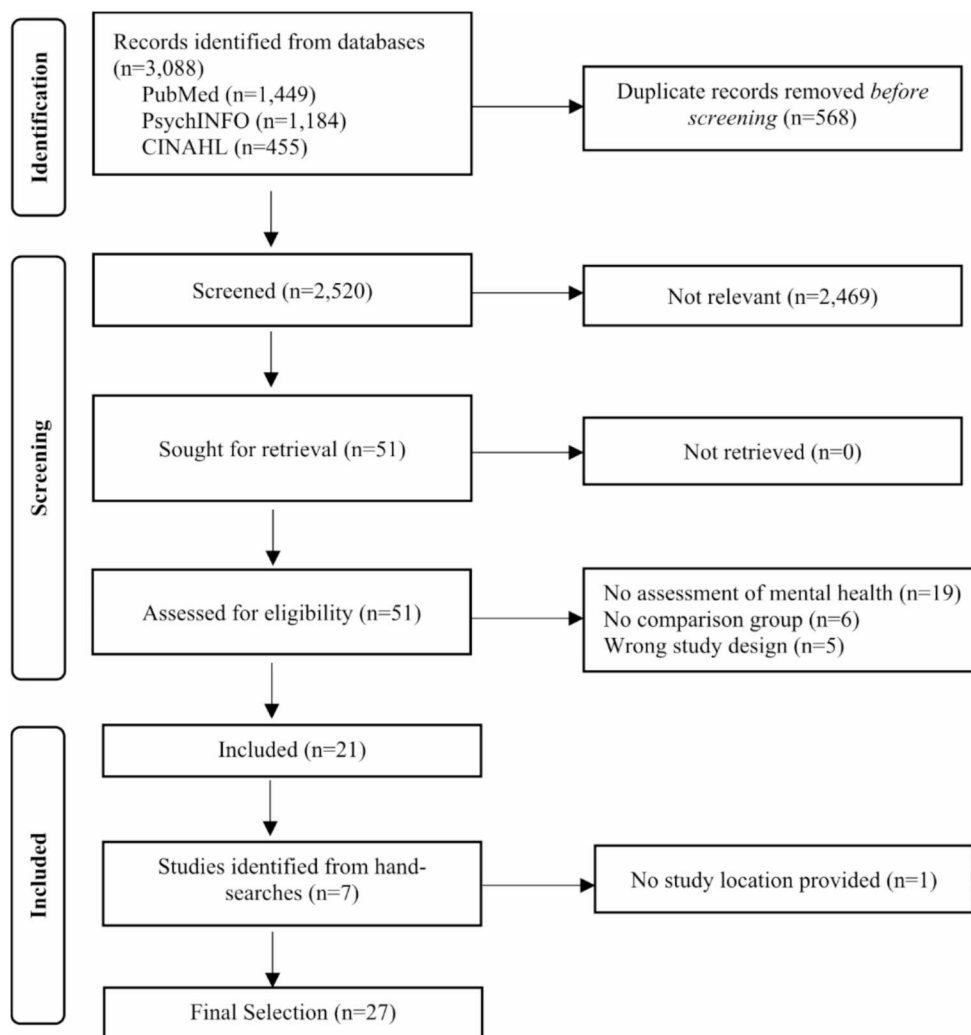
Identification of included studies

A PRISMA flow chart of studies identified during the screening and review processes is shown in Fig. 1. The initial search yielded 3,088 studies and 568 duplicates were removed; 2,433 and 66 studies were excluded during title/abstract screening and full-text review, respectively. One study met inclusion criteria, but did not report on location and was excluded (Tymchuk 1994). Twenty-seven studies were included; 21 studies were identified from the search strategy and six studies were identified from hand-searches.

Characteristics of included studies

Of the 27 included studies, 18 were cross-sectional or exploratory, seven were retrospective cohorts, and two were prospective cohorts. Sixteen studies were conducted in the U.S. using data collected from: Massachusetts Pregnancy to Early Life Longitudinal Data System (PELL,

Fig. 1 PRISMA flow diagram of the study selection process



$n=2$) (Clements et al. 2018; Mitra et al. 2019); Pregnancy Risk Assessment Monitoring System (PRAMS), multiple states ($n=1$) (Alhusen et al. 2023), Massachusetts ($n=2$) (Booth et al. 2021; Chen et al. 2023), Rhode Island ($n=2$) (Mitra, Clements, et al. 2015a; Mitra, Iezzoni, et al., 2015b); Behavioral Risk Factor Surveillance System (BRFSS), multiple states ($n=2$) (Horner-Johnson et al. 2021; Mitra et al. 2016) and Washington ($n=1$) (Kim et al. 2013); National Health Interview Study (NHIS, $n=1$) (Iezzoni et al. 2015); National Health and Nutrition Examination Surveys (NHANES, $n=1$) (Deierlein et al. 2022); Massachusetts All Payers Claims database ($n=1$) (Clements et al. 2020); California state linked health administrative data ($n=1$) (Horner-Johnson et al. 2022); Washington state linked birth-hospital discharge records ($n=1$) (Crane et al. 2019); and an online survey ($n=1$) (Pohl et al. 2020). Four studies were conducted in Canada, all of which used linked Ontario health administrative data (Brown, Chen, et al., 2022a; Brown, Vigod, et al., 2017; b; Tarasoff et al. 2020a, b, c). The remaining studies were conducted in the United Kingdom (U.K., $n=3$) (Hindmarsh et al. 2015; Malouf et al. 2017; Redshaw et al. 2013), Australia ($n=2$) (Llewellyn et al. 2003; McConnell et al. 2008), or Germany ($n=1$) (Thiels and Steinhausen 1994); and one study was an online survey distributed internationally (Pohl et al. 2020).

Eleven studies assessed disability status using clinical diagnoses or diagnostic codes (Brown, Chen, et al. 2022a; Brown et al. 2017; Brown, Vigod, et al. 2022b; Clements et al. 2018, 2020; Crane et al. 2019; Horner-Johnson et al. 2022; Llewellyn et al. 2003; Mitra et al. 2019; Tarasoff et al. 2020a, b, c; Thiels and Steinhausen 1994); one study used a vocabulary test to determine intellectual impairment (Powell et al. 2017); the remaining 15 studies relied on self-reported measures. There were nine studies among populations with IDD (Brown et al. 2017; Clements et al. 2020; Hindmarsh et al. 2015; Llewellyn et al. 2003; McConnell et al. 2008; Mitra et al. 2019; Pohl et al. 2020; Powell et al. 2017; Thiels and Steinhausen 1994); two studies among populations with physical disabilities (Crane et al. 2019; Iezzoni et al. 2015); and ten studies among populations with any type of disability (studies that examined associations by all types of disabilities collectively) (Alhusen et al. 2023; Booth et al. 2021; Chen et al. 2023; Clements et al. 2018; Deierlein et al. 2022; Horner-Johnson et al. 2021; Kim et al. 2013; Mitra, Clements, et al. 2015a; Mitra et al. 2016; Mitra, Iezzoni, et al. 2015b). Six studies examined different types of disabilities, categorized as: physical, sensory, IDD, and multiple disabilities (defined as two or more types of disabilities, $n=3$) (Brown, Chen, et al. 2022a; Brown, Vigod, et al. 2022b; Tarasoff et al. 2020a, b, c); physical, hearing, vision, and IDD ($n=1$) (Horner-Johnson et al. 2022); and physical, sensory, mental health, learning, and

multiple disabilities ($n=2$) (Malouf et al. 2017; Redshaw et al. 2013). For mental health outcomes, nine studies used diagnostic codes for mental health disorders or mental health care utilization (Brown, Chen, et al. 2022a; Brown et al. 2017; Brown, Vigod, et al. 2022b; Clements et al. 2018, 2020; Crane et al. 2019; Horner-Johnson et al. 2022; Mitra et al. 2019; Tarasoff et al. 2020a, b, c). The remaining studies used outcomes based on self-report from survey questions and/or screening instruments. Studies examined mental health outcomes during prepregnancy, pregnancy, postpartum, and/or parenting; no studies examined outcomes related to menstruation, fertility, or menopause. There were two studies that examined associations stratified by race and ethnicity (Chen et al. 2023; Horner-Johnson et al. 2021).

Study quality assessment

Table 1 shows the quality assessment ratings for each study. Nineteen studies were rated as weak, three were rated as moderate, and five were rated as strong. Characteristics of studies rated as weak included cross-sectional study design, self-reported disability and mental health measures, convenience samples, and/or limited or no adjustment for confounders. Characteristics of studies rated as strong included population-based cohorts, disability and mental health measures based on diagnostic codes, large sample sizes, and adequate adjustment for confounders. Studies rated as moderate had some, but not all, of the characteristics as studies rated as strong.

Synthesis of results

The study results are shown in Table 1 (detailed data extraction is provided in Supplementary Table 2). Results are displayed in the table and synthesized in the text by disability type(s) (IDD, physical disabilities, any disabilities, and categorized types of disabilities) and reproductive health time period examined in studies.

Intellectual and developmental disabilities

Nine studies examined mental health outcomes during pregnancy, postpartum, and/or parenting among women with IDD (Brown et al. 2017; Clements et al. 2020; Hindmarsh et al. 2015; Llewellyn et al. 2003; McConnell et al. 2008; Mitra et al. 2019; Pohl et al. 2020; Powell et al. 2017; Thiels and Steinhausen 1994). During pregnancy and/or the postpartum, seven studies found that women with IDD were more likely to have depression (McConnell et al. 2008; Pohl et al. 2020), anxiety (McConnell et al. 2008), and mental-health related outpatient visits (Clements et al. 2020), emergency department visits (Brown et al. 2017; Mitra et al. 2019),

Table 1 Characteristics of included studies displayed by disability type and reproductive health time period

Authors (Year)	Study design	Setting	Reproductive health period ¹	Disability assessment	Sample size of population with disabilities	Mental health assessment	Mental health outcomes for women with disabilities compared to reference group	Quality assessment ²
Intellectual and Developmental Disabilities (IDD), 9 articles								
McConnell et al. (2008)	Prospective cohort	Prenatal clinics, Australia 2002	Pregnancy	Self-reported learning difficulties or intellectual disability	n = 31	Depression Anxiety Stress Scales	Greater risk of moderate to severe depression, moderate to severe anxiety Reference group: Australian general adult population	Weak
Pohl et al. (2020)	Cross-sectional	Online survey (International) Year: Not reported	Pregnancy Postpartum Parenting	Self-reported autism	n = 355	Self-reported depression	Higher prevalence of depression at both time points Higher proportions disagreed with statements of being able to cope with responsibilities of parenting and reported finding motherhood to be an isolating experience Reference group: No autism	Weak
Brown et al. (2017)	Population-based retrospective cohort	Linked health administrative data, Ontario, Canada 2002–2012	Postpartum	Diagnostic codes or documentation of disability support program	n = 3,803	Diagnostic codes for mental health-related emergency department (ED) visits or hospital admissions (0–7, 8–42, and 0–42 days)	Greater risk of postpartum ED visits and hospital admissions at all time points Reference group: No IDD	Strong
Clements et al. (2020)	Matched retrospective cohort	All Payers Claims database Massachusetts, United States (U.S.) 2012–2015	Postpartum	Diagnostic codes	n = 962	Diagnostic codes for mental health-related visits during early (21–56 days) and late (57–365 days) postpartum	Greater risk of visits during early and late postpartum Reference group: No IDD	Moderate
Mitra et al. (2019)	Retrospective cohort	Massachusetts Pregnancy to Early Life Longitudinal Data System (PELL), U.S. 2002–2010	Postpartum	Diagnostic codes	n = 776	Diagnostic codes for mental health conditions; mental health-related ED visit (1–42, 1–90, 1–365 days)	Higher proportions of postpartum mood disorders Greater risk of mental health-related ED visits Reference group: No IDD	Strong
Hindmarsh et al. (2015)	Cross-sectional	Millennium Cohort Study, United Kingdom (U.K.) 2000–2002	Postpartum Parenting	Self-reported or survey questions for determination of severely restricted literacy, numeracy, and educational attainment	n = 74	Self-reported and screening tools related to mental health, psychological well-being, life satisfaction, and social support	No difference in postpartum mental health measures More likely to report feeling like a failure Higher proportions had lower life satisfaction scores, reported fewer social supports Higher proportions reported having no one to share their feelings with, there were no other parents to talk to about experiences Reference group: No IDD	Weak

Table 1 (continued)

Authors (Year)	Study design	Setting	Reproductive health period ¹	Disability assessment	Sample size of population with disabilities	Mental health assessment	Mental health outcomes for women with disabilities compared to reference group	Quality assessment ²
Thiels and Steinhilber (1994)	Prospective cohort	Prenatal clinics, Germany 1976–1990	Postpartum Parenting	Diagnosed epilepsy	<i>n</i> = 48	Present State Examination	Higher (worse) total score Higher scores for non-specific neurotic syndromes, simple depression, tension, worrying, and loss of interest and concentration at one or both time points Reference group: No epilepsy	Weak
Llewellyn et al. (2003)	Cross-sectional	Social welfare agencies, Australia Year: Not reported	Parenting	Diagnosed, history of special education, identified learning difficulties and intellectual limitations	<i>n</i> = 50	Short Form Health Survey (subscale measure of mental health)	Lower (worse) mental health scores Reference group: Australian women in general population	Weak
Powell et al. (2017)	Exploratory, cross-sectional	Fragile Families and Child Well-Being Study, U.S. 1998–2000	Parenting	Intellectual impairment defined as Peabody Picture Vocabulary Test-Revised score < 80	<i>n</i> = 263	Composite International Diagnostic Interview, parenting stress questions	No differences for major depression or generalized anxiety disorder More likely to report high parenting stress Reference group: No intellectual impairments	Weak
Physical Disabilities, 2 articles								
Iezzoni et al. (2015)	Cross-sectional	National Health Interview Study (NHIS), U.S. 2006–2011	Pregnancy	Self-reported functional impairments of upper or lower extremities that limit mobility	<i>n</i> = 6,043	Self-reported mental health, emotional problems	Higher proportions reported feeling sad, nervous, restless or fidgety, hopeless, everything an effort, worthless, feelings interfere with life, and any emotional problem (among currently pregnant and not pregnant) More likely to have any mental health problem Reference group: No disabilities	Weak
Crane et al. (2019)	Retrospective cohort	Linked birth-hospital discharge records Washington, U.S. 1987–2012	Postpartum	Diagnostic codes for spinal cord injury, paralysis, or spina bifida	<i>n</i> = 559	Diagnostic codes for postpartum depression-related hospitalization	Greater risk of hospitalization for all disability types Reference group: No disabilities	Moderate
Any Disabilities, 10 articles								
Deierlein et al. (2022)	Cross-sectional	National Health and Nutrition Examination Surveys (NHANES), U.S. 2013–2018	Prepregnancy	Self-reported difficulties with hearing; seeing; concentrating, remembering, or making decisions; walking or climbing stairs; dressing or bathing; or doing errands alone	<i>n</i> = 601	Patient Health Questionnaire-9 Self-reported mental health professional visit in previous year	More likely to have mild to severe depression More likely to report seeing a mental health professional Reference group: No disabilities	Weak

Table 1 (continued)

Authors (Year)	Study design	Setting	Reproductive health period ¹	Disability assessment	Sample size of population with disabilities	Mental health assessment	Mental health outcomes for women with disabilities compared to reference group	Quality assessment ²
Horner-Johnson et al. (2021)	Cross-sectional	Behavioral Risk Factor Surveillance System (BRFSS), U.S. 2016	Prepregnancy	Self-reported difficulties with hearing; seeing; concentrating; or making decisions; walking or climbing stairs; dressing or bathing; or doing errands alone	n = 9,700	Self-reported mental distress and social support	Across race/ethnic groups, women with disabilities more likely to have frequent mental distress and inadequate social support compared to women without disabilities Reference group: No disabilities	Weak
Mitra et al. (2016)	Cross-sectional	BRFSS, U.S. 2010	Prepregnancy	Self-reported limitations with activities because of a physical, mental, or emotional problem; health problem that requires use of special equipment (e.g., cane, wheelchair)	n = 8,370	Self-reported mental distress	More likely to have frequent mental distress compared to women without disabilities Reference group: No disabilities	Weak
Mitra et al. (2015a)	Cross-sectional	Pregnancy Risk Assessment Monitoring System (PRAMS) Rhode Island, U.S. 2009–2011	Prepregnancy Postpartum	Self-reported limitations in any activities due to physical, mental, or emotional problems	n = 287	Self-reported depression before and during pregnancy; mental health care visits, postpartum depression	Greater prevalence of depression and receipt of mental health care before and during pregnancy, more likely to have postpartum depression Reference group: No disabilities	Weak
Mitra et al. (2015a)	Cross-sectional	PRAMS, Rhode Island, U.S. 2002–2011	Pregnancy	Self-reported limitations in any activities due to physical, mental, or emotional problems	n = 1,015	Self-reported stressful life events	Greater prevalence of emotional, partner-related, financial, and traumatic stressful life events Reference group: No disabilities	Weak
Clements et al. (2018)	Population-based retrospective cohort	Massachusetts PELL, U.S. 2006–2009	Pregnancy	Diagnostic codes based on Access Risk Classification System to identify individuals likely to have functional limitations	n = 8,786	Diagnostic codes for mental health-related ED visit	Higher proportion of ED visits Reference group: No disabilities	Moderate
Alhusen et al. (2023)	Cross-sectional	PRAMS, U.S. 2018–2020	Pregnancy Postpartum	Self-reported based on Washington group questions short set	n = 2,585	Self-reported depression	More likely to report depression during pregnancy and postpartum Reference group: No disabilities	Weak

Table 1 (continued)

Authors (Year)	Study design	Setting	Reproductive health period ¹	Disability assessment	Sample size of population with disabilities	Mental health assessment	Mental health outcomes for women with disabilities compared to reference group	Quality assessment ²
Booth et al. (2021)	Cross-sectional	PRAMS, Massachusetts, U.S. 2012–2017	Postpartum	Self-reported limitations in any activities due to physical, mental, or emotional problems; difficulty concentrating, remembering, or making decisions; difficulty walking or climbing stairs	<i>n</i> = 710	Self-reported postpartum depression, stressful life events	Higher proportion of stressful life events More likely to report postpartum depression with higher number of stressful life events, especially relational and traumatic events Reference group: No disabilities	Weak
Chen et al. (2023)	Cross-sectional	PRAMS, Massachusetts, U.S. 2016–2020	Postpartum	Self-reported difficulty walking or climbing stairs; difficulty concentrating, remembering, or making decisions	<i>n</i> = 746	Self-reported postpartum depression, stressful life events	More likely to report postpartum depression and financial, relational, traumatic, and emotional stress, and any stress Observed associations were similar across race/ethnic groups Reference group: No disabilities	Weak
Kim et al. (2013)	Cross-sectional	BRFSS, Washington, U.S. 2003–2009	Parenting	Self-reported limitations with activities because of a physical, mental, or emotional problem; health problem that requires use of special equipment (e.g., cane, wheelchair)	<i>n</i> = 5,295	Self-reported mental distress, social support	More likely to report frequent mental distress (> 14 days in past 30 days) More likely to report inadequate emotional and social support Reference group: No disabilities	Weak
Categorized Types of Disabilities, 6 articles								
Tarasoff et al. (2020a, b, c)	Cross-sectional	Linked health administrative data, Ontario, Canada 2017–2018	Prepregnancy	Diagnostic codes for physical, sensory, IDD, multiple disabilities	Physical, <i>n</i> = 253,184 Sensory, <i>n</i> = 93,170 IDD, <i>n</i> = 8,986 Multiple, <i>n</i> = 29,868	Diagnostic codes for mental health disorders	Higher proportion of psychotic disorders: IDD and multiple disabilities Higher proportion of mood/anxiety disorders: physical, sensory, IDD, and multiple disabilities Higher proportion of other mental illness: IDD and multiple disabilities Higher proportion of substance use disorders: IDD Higher proportion of self-harm: IDD and multiple disabilities Reference group: No disabilities	Weak

Table 1 (continued)

Authors (Year)	Study design	Setting	Reproductive health period ¹	Disability assessment	Sample size of population with disabilities	Mental health assessment	Mental health outcomes for women with disabilities compared to reference group	Quality assessment ²
Brown et al. (2022b)	Population-based retrospective cohort	Linked health administrative data, Ontario, Canada 2003–2018	Pregnancy Postpartum	Diagnostic codes for physical, sensory, IDD, or multiple disabilities	Physical, <i>n</i> = 155,500 Sensory, <i>n</i> = 49,338 IDD, <i>n</i> = 2,650 Multiple, <i>n</i> = 9,904	Diagnostic codes for perinatal mental illness (conception to 365 days postpartum)	Greater risk of perinatal mental illness independent of pre-existing mental health illness Greatest risks among women with IDD and multiple disabilities Reference group: No disabilities	Strong
Horner-Johnson et al. (2022)	Population-based retrospective cohort	Linked hospital discharge, birth and death certificates, California, U.S. 2000–2012	Pregnancy	Diagnostic codes for physical, hearing, vision, IDD	Physical, <i>n</i> = 27,761 Hearing, <i>n</i> = 2,359 Vision, <i>n</i> = 1,790 IDD, <i>n</i> = 1,488	Diagnostic codes for mental disorders complicating pregnancy, childbirth, or puerperium	Greater risk of mental disorders across all disability types Reference group: No disabilities	Strong
Redshaw et al. (2013)	Cross-sectional	National Health Service trusts survey, U.K. 2010	Pregnancy Postpartum	Self-reported physical, sensory, mental health, learning, and multiple disabilities	Physical, <i>n</i> = 730 Sensory, <i>n</i> = 197 Learning, <i>n</i> = 120 Multiple, <i>n</i> = 99	Self-reported mental health-related care during pregnancy and postpartum	Left alone and worried during labor and birth: sensory, learning disabilities Less likely to receive enough information about emotional changes: multiple disabilities Reference group: No disabilities	Weak

Table 1 (continued)

Authors (Year)	Study design	Setting	Reproductive health period ¹	Disability assessment	Sample size of population with disabilities	Mental health assessment	Mental health outcomes for women with disabilities compared to reference group	Quality assessment ²
Malouf et al. (2017)	Cross-sectional	National Health Service trusts survey, U.K. 2015	Pregnancy Postpartum	Self-reported physical, sensory, mental health, learning, and multiple disabilities	Physical, $n = 873$ Sensory, $n = 174$ Learning, $n = 127$ Multiple, $n = 120$	Self-reported mental health-related care during pregnancy and postpartum	More likely to feel left alone and worried during labor and birth: learning disabilities Less likely to report: - Midwife asked how feeling emotionally during antenatal care: physical disabilities - Midwife asked how feeling emotionally during postnatal care: physical, learning disabilities - Received enough information about emotional changes: physical disabilities - Told who to contact for emotional changes: physical disabilities Reference group: No disabilities	Weak
Brown et al. (2022b)	Population-based retrospective cohort	Linked health administrative data, Ontario, Canada 2003–2019	Postpartum	Diagnostic codes physical, sensory, IDD, or multiple disabilities	Physical, $n = 144,972$ Sensory, $n = 45,249$ IDD, $n = 2,227$ Multiple, $n = 8,883$	Diagnostic codes for mental health-related ED visits or hospital admissions (0–365 days postpartum)	Greater risks of: ED visits for physical disabilities and IDD (0–7, 8–42 days); all types (43–365 days) Hospital admissions for IDD and multiple disabilities (0–7, 8–42 days); all types (43–365 days) Reference group: No disabilities	Strong

¹Reproductive health periods were defined as: pre-pregnancy, mental health outcomes assessed among non-pregnant, reproductive-aged women; pregnancy, mental health outcomes assessed during pregnancy; postpartum, mental health outcomes assessed during the postpartum period; and parenting, mental health outcomes assessed in relation to caring for children

²Quality assessment was based on ratings from the Effective Public Health Practice Project Quality Assessment Tool. Characteristics of studies rated as weak included cross-sectional study design, self-reported disability and mental health measures, convenience samples, and/or limited or no adjustment for confounders. Characteristics of studies rated as strong included population-based cohorts, disability and mental health measures based on diagnostic codes, large sample sizes, and adequate adjustment for confounders. Studies rated as moderate had some, but not all, of the characteristics as studies rated as strong

and hospital admissions (Brown et al. 2017). McConnell et al. (2008) found that Australian pregnant women with IDD were nearly four times more likely to have moderate to severe depression (odds ratio, OR=3.9; 95% confidence interval, CI: 1.83–8.20) and seven times more likely to have moderate to severe anxiety (OR=6.7; 95% CI: 3.24–13.79) compared to the general adult population (based on the Depression Anxiety Stress Scale). Pohl et al. (2020) reported a higher prevalence of self-reported prenatal and postpartum depression among women with autism who had ever been pregnant compared to their counterparts without autism. Only one study, by Hindmarsh et al. (2015), found no differences in postpartum mental health and psychosocial well-being measures between women with and without IDD who participated in the U.K. Millennium Cohort Study (2000–2002); however, higher proportions of women with IDD reported feeling like a failure, lower life satisfaction, and fewer social supports.

Using the Ontario, Canada health administrative data (2002–2012), Brown et al. (2017) reported a greater risk of postpartum emergency department visits and hospital admissions for psychiatric reasons through 42 days post-delivery discharge. Clements et al. (2020) found a greater risk of healthcare visits for psychological or psychiatric evaluation during early (21–56 days) and late (57–365) postpartum among women with IDD compared to those without disabilities in the Massachusetts All Payers Claims Database (2012–2015). Similarly, Mitra et al. (2019) reported six times (adjusted hazard ratio, aHR=6.01; 95% CI: 4.38–8.25) greater risk of mental health-related emergency department visits during the first year postpartum for women with IDD in Massachusetts PELL, 2002–2010.

Four studies examined mental health related to parenting (Hindmarsh et al. 2015; Llewellyn et al. 2003; Powell et al. 2017; Thiels and Steinhausen 1994). Compared to women without disabilities (or the general population (Llewellyn et al. 2003)), higher proportions of women with IDD reported having no other parents to talk to about experiences (Hindmarsh et al. 2015), high parenting stress (Powell et al. 2017), and worse mental health or depressive symptom indicators (Llewellyn et al. 2003; Thiels and Steinhausen 1994).

Physical disabilities

Two studies examined mental health outcomes during pregnancy or the postpartum among women with physical disabilities (Crane et al. 2019; Iezzoni et al. 2015). Iezzoni et al. (2015) used the U.S. NHIS, 2006–2011, to examine mental health among women of reproductive age (18–49 years) by chronic physical disability status and current pregnancy status. Independent of pregnancy status, higher proportions of women with chronic physical disabilities reported

poor mental health indicators and any emotional problems compared to those without disabilities (Iezzoni et al. 2015). Using Washington State linked birth-hospital discharge records (1987–2012), Crane et al. (2019) found that women with spinal cord injuries, paralysis, or spina bifida were eight times (adjusted risk ratio, aRR=8.15; 95% CI: 4.29–15.48) more likely to have postpartum depression-related hospitalizations compared to women without disabilities.

Any disabilities

Ten studies examined mental health outcomes during pre-pregnancy, pregnancy, postpartum, and/or parenting among women with any type of disability (Alhusen et al. 2023; Booth et al. 2021; Chen et al. 2023; Clements et al. 2018; Deierlein et al. 2022; Horner-Johnson et al. 2021; Kim et al. 2013; Mitra, Clements, et al. 2015a; Mitra et al. 2016; Mitra, Iezzoni, et al. 2015b). Three of these studies examined mental health among women of reproductive age (18–44 years) with self-reported disabilities (Deierlein et al. 2022; Horner-Johnson et al. 2021; Mitra et al. 2016). In analyses of the BRFSS 2010 (Mitra et al. 2016) and 2016 (Horner-Johnson et al. 2021), women with disabilities reported greater mental distress (Horner-Johnson et al. 2021; Mitra et al. 2016) compared to those without disabilities; differences did not vary by race and ethnicity (Horner-Johnson et al. 2021). In NHANES 2013–2018, women with disabilities were more likely to report mild to severe depression and seeing a mental health professional during the previous year (Deierlein et al. 2022).

Six studies examined mental health during pregnancy and/or the postpartum. Clements et al. (2018) found higher proportions of mental illness-related antenatal emergency department visits among women with disabilities compared to those without disabilities using the Massachusetts PELL 2006–2009. In U.S. PRAMS, 2018–2020 (24 participating states), women with disabilities were twice as likely to report depressive symptoms during pregnancy and the postpartum as women without disabilities (aOR=2.43; 95% CI: 1.97–2.99 and aOR=2.14; 95% CI: 1.80–2.54, respectively) (Alhusen et al. 2023). Two studies used Rhode Island PRAMS 2002–2011 (Mitra, Clements, et al. 2015a) and 2009–2011 (Mitra, Iezzoni, et al. 2015b). Greater proportions of women with disabilities reported experiencing life stressors (emotional, traumatic, relational, financial) and stressful life events in the 12 months prior to childbirth and receiving a depression diagnosis before, during, and after their pregnancies (Mitra, Clements, et al. 2015a); women with disabilities were nearly twice as likely (aRR=1.6; 95%CI: 1.1–2.2) to report postpartum depressive symptoms compared to those without disabilities (Mitra, Iezzoni, et al. 2015b). Similar associations were observed in two

studies using Massachusetts PRAMS 2012–2017 (Booth et al. 2021) and 2016–2020 (Chen et al. 2023). Women with disabilities were more likely to report life stressors (Booth et al. 2021; Chen et al. 2023), inadequate postpartum social support (Chen et al. 2023), and postpartum depressive symptoms (Booth et al. 2021; Chen et al. 2023). Associations between disability and postpartum depressive symptoms were stronger among non-Hispanic white women and Hispanic women compared to among non-Hispanic Black women and non-Hispanic Asian women (Chen et al. 2023).

One study examined mental health indicators of childrearing women (defined as women ages 18–59 years living with children less than age 18 years) in the Washington State BRFSS 2003–2009 (Kim et al. 2013). Women with disabilities were four times (aOR = 4.02; 95% CI: 3.60–4.50) more likely to report frequent mental distress in the past month compared to women without disabilities (Kim et al. 2013).

Categorized types of disabilities

Five studies examined mental health during prepregnancy, pregnancy, and/or postpartum across different types of disabilities (Brown, Chen, et al. 2022a; Horner-Johnson et al. 2022; Malouf et al. 2017; Tarasoff et al. 2020a, b, c). Three studies used health administrative data from Ontario, Canada (Brown, Chen, et al. 2022a; Brown, Vigod, et al. 2022b; Tarasoff et al. 2020a, b; Tarasoff et al. 2020c). Tarasoff et al. (2020a, b, c) examined age-standardized prevalence of mental illness diagnoses, defined as psychotic disorders, mood/anxiety disorders, other mental illnesses, substance use disorders, and self-harm, among reproductive-aged women (15–44 years, data from 2017 to 2018). Disability was categorized as physical, sensory, IDD, multiple, and no disabilities. Clinically meaningful standardized differences in rates of mental health diagnoses were observed only for women with IDD (all types of mental illness diagnoses) and women with multiple disabilities (psychotic disorders, mood/anxiety disorders, other mental illnesses, and self-harm) compared to those without disabilities. No differences in mental health outcomes were observed between women with physical or sensory disabilities and those without disabilities (Tarasoff et al. 2020a, b, c).

Two studies examined risk of perinatal mental illness, spanning conception to 365 days postpartum, and mental health-related visits among Canadian women with physical, sensory, IDD, and multiple disabilities compared to those without disabilities (2003–2018 (Brown, Vigod, et al. 2022b) and 2003–2019 (Brown, Chen, et al. 2022a)). Women with all types of disabilities had elevated risks of perinatal mental illness, outpatient mental health visits, psychiatric emergency department visits, and psychiatric hospital admissions compared to women without disabilities,

independent of history of mental illness. The greatest risks were observed among women with IDD and women with multiple disabilities (Brown, Chen, et al. 2022a; Brown, Vigod, et al. 2022b), especially those with a history of mental illness (Brown, Vigod, et al. 2022b).

Horner-Johnson et al. (2022) examined perinatal mental health disorders (pregnancy, childbirth, and/or puerperium) among women with physical, hearing, vision, and IDD using California State linked birth certificate, death certificate, and hospital discharge data (2000–2012). Women with all types of disabilities were at increased risk of having a perinatal mental health disorder compared to those without disabilities. The greatest risks were among women with IDD; women with IDD were nine times (aRR = 9.47; 95% CI: 8.68–10.33) more likely to have perinatal mental health disorders, while women with hearing, vision, and physical disabilities were two to three times (aRR = 2.40; 95% CI: 2.05–2.79, aRR = 2.43; 95% CI: 2.08–2.83, and aRR = 3.09; 95% CI: 2.97–3.21, respectively) more likely to have disorders compared to women without disabilities (Horner-Johnson et al. 2022).

Two studies used U.K. national survey data (2010 (Redshaw et al. 2013) and 2015 (Malouf et al. 2017)) to examine perceptions of mental health-related care received during pregnancy and the postpartum among women with physical, sensory, learning, and multiple disabilities (mental health disabilities were examined but excluded for this review). Compared to women without disabilities, women with learning (Malouf et al. 2017; Redshaw et al. 2013) or sensory disabilities (Malouf et al. 2017) were more likely to report being left alone and feeling worried at some point during labor and birth care; women with physical disabilities were less likely to report being asked how they were feeling emotionally during the antenatal period (Malouf et al. 2017); women with physical or learning disabilities were less likely to report being asked how they were feeling emotionally during the postnatal period (Malouf et al. 2017); women with physical (Malouf et al. 2017) or multiple disabilities (Redshaw et al. 2013) were less likely to report being given enough information about postpartum emotional changes; and women with physical disabilities were less likely to report being told who to contact about emotional changes (Malouf et al. 2017).

Discussion

Previous reviews summarized findings on perinatal and infant health risks among women with disabilities (Deierlein et al. 2021; Tarasoff et al. 2020b; Tarasoff, Ravindran, Tarasoff et al. 2020a, b, c). The current systematic review uniquely adds to this knowledge base by focusing on mental

health outcomes within the context of reproductive health, specifically prepregnancy, pregnancy, postpartum, and parenting, among women with and without disabilities. None of the included studies examined reproductive health time periods related to menstruation, fertility, or menopause. Women of reproductive age with disabilities were more likely to have mental distress, stressful life events, and diagnosed mental health disorders compared to women without disabilities. During pregnancy and the postpartum, women with disabilities were at greater risk of diagnosed perinatal mental disorders and psychiatric emergency department visits and hospital admissions. Though relatively fewer studies examined mental health related to parenting, findings suggested mental distress and inadequate emotional and social support among women with disabilities. In studies that examined associations stratified by disability type, the greatest mental health risks were often observed among women with IDD and among women with multiple types of disabilities.

Undiagnosed and untreated mental health conditions are of great public health concern (Kohn et al. 2004). In the general U.S. adult population, women with disabilities are disproportionately affected by poor mental health, with higher rates of frequent mental distress compared to women without disabilities and compared to men with disabilities (Cree et al. 2020). These inequities are likely due to a combination of factors linked to poor mental health, often rooted in ableism, that jointly and disproportionately affect women with disabilities. These factors include interpersonal violence, discrimination, social isolation, limited access to healthcare, and lack of independence in making healthcare decisions (Alhusen et al. 2021, 2023; Amos et al. 2023; Matin et al. 2021). Women with disabilities often report that they can't find or do not receive reproductive health information (Iezzoni et al. 2017; Tarasoff et al. 2023a, b), have negative experiences related to clinicians' knowledge, assumptions, and bedside manner (Mitra et al. 2017a; Tarasoff 2017; Tarasoff et al. 2023b), and encounter inaccessibility during their care (e.g., inappropriate communication methods, lack of accessible equipment) (Streur et al. 2019, 2020; Tarasoff et al. 2023b). These experiences likely contribute to emotional distress and anxiety, especially in relation to reproductive health (Lawler et al. 2015; Öksüz 2021). Parents with disabilities also have high rates of interaction with the child welfare system and are more likely to have their parental rights terminated compared to those without disabilities (DeZelar and Lightfoot 2018; LaLiberte et al. 2017), potentially further exacerbating poor mental health (Lipson and Rogers 2000).

The findings from this review suggest improvement areas for practice and policy to address mental health inequities for women with disabilities during key reproductive health time

periods. Primary care-related healthcare organizations, such as the U.S. Preventive Services Task Force (Siu et al. 2016) and the American College of Obstetrics and Gynecology (ACOG 2018), recommend universal screening for depression and anxiety disorders with adequate systems in place to ensure diagnosis, treatment, and appropriate follow-up, especially for patients at high risk for mental illness. However, for all women, screenings are often not consistently administered or tracked, notably during pregnancy and the postpartum when mental health disorders are common (Woody et al. 2017). This is likely compounded by disability status, as other medical complications or concerns may be prioritized during healthcare visits (Tarasoff et al. 2020) and the available screening tools, including administration methods (e.g., tablet, clinician-administered) and specific questions asked (e.g., level of intellectual ability required), may not be suitable for some populations with disabilities (Anderson et al. 2021; Gaskin and James 2006). Within the healthcare pathway to address depression, screening is the first and necessary step (Byatt et al. 2019). Consistent and adaptive mental health screening in clinical settings for women with disabilities (and all women), particularly during reproductive healthcare visits, is needed.

Increased capacity of clinicians to identify and treat mental illness requires education and training in mental health and in caring for persons with disabilities. Reproductive health clinicians are often ill equipped to administer mental health screens, respond to positive screens, or provide counseling to patients with mental health conditions or who use pharmacotherapy (Byatt et al. 2012; Gjerdingen and Yawn 2007; Mitchell and Coyne 2009). Similarly, clinicians report receiving no formal training about disability and feeling uncomfortable or unable to talk confidently to patients about how their disability affects their care (Mitra et al. 2017b; Smeltzer et al. 2018; Streur et al. 2018, 2023). Ableism (defined as discrimination and social prejudice against persons with disabilities) and sanism (defined as discrimination against and oppression of persons perceived to have a mental disorder or cognitive impairment) within healthcare settings must also be acknowledged and integrated into clinical curriculum (Petersen and Chase 2023; Poole 2024). Comprehensive care pathways that allow for easy collaboration of clinicians, such as in obstetrics, psychiatry, and social work, are successful for diagnosing perinatal mental illness and improving health outcomes (Byatt et al. 2019; Miller et al. 2020). For women with disabilities, it is critical that these pathways incorporate clinicians with expertise in providing disability-specific care and that their care is coordinated. Disability-specific care encompasses informed medical care as well as an understanding of the numerous individual, social, and environmental disadvantages experienced by women with disabilities (Iezzoni and Long-Bellil

2012). Additionally, care should be person-centered, allowing for shared decision-making, supporting self-advocacy, and enhancing communication with clinicians (Care, 2016). A decision-making tool was only recently developed for persons with physical disabilities considering or actively trying to become pregnant (Kalpakjian et al. 2023). Future research should investigate integration and effectiveness of care pathways, person-centered care, and healthcare decision-making among women with disabilities.

There were noticeable gaps in the literature regarding mental health related to menstruation, fertility, parenting, and menopause and disability status among women. Poor mental health around these time periods is common in non-disabled populations (Chen et al. 2004; Epifanio et al. 2015; Jang and Elfenbein 2019; Lewis Johnson et al. 2023); research is needed to understand how women with disabilities may be differentially affected and to develop strategies to support them. As mentioned, commonly used screening tools should be adapted to meet disability-specific needs. For example, studies have examined validity and use of depression screening tools for populations with learning disabilities (Gaskin and James 2006), populations with epilepsy (Gill et al. 2017), and American sign language users (Anderson et al. 2021), as well as a Menopause Symptom List among women with physical disabilities (Kalpakjian et al. 2005). However, there remains limited investigation of adaptations that need to be made and for which populations. The extent to which social determinants pertain to and influence inequities in reproductive and mental health care and health outcomes among women with disabilities has also largely been unaddressed in the literature. In this review, only two studies examined interactions of disability and race and ethnicity, finding generally similar associations for disability and mental health across race and ethnic groups. Further research on the intersection of disability with other social positions (e.g., healthcare payer, sexual orientation, rural residence) is needed (Horner-Johnson 2021).

Limitations of the evidence included in the review

Disability status was defined and categorized in different ways across studies, each with unique limitations. Studies using health administrative data only identify women with medical diagnoses associated with disability risk, which includes women who may not have a disability and excludes women who have a disability without a documented diagnosis. In contrast, studies using self-reported functional impairments incorporate both medical and environmental influences of disability. These studies often dichotomize disability as none versus any, which provides no context of disability type or severity; or categorize disability by broad types, like physical disabilities, which includes a wide range

of causes and severity of impairments. None of the studies assessed self-identified disability status, which has been associated with varying perceptions and ratings of health care receipt, and in combination with functional impairments may provide a better understanding of health inequities (Salinger et al. 2023). Mental health outcomes were captured using a range of diagnostic codes, screening tools, or self-reported measures. Diagnostic codes may only identify the most severe cases, while screening tools or other methods may not accurately assess mental health outcomes in all populations with disabilities. Studies examining perinatal mental health outcomes did not always measure or account for pre-existing mental health conditions, an important risk factor for poor perinatal mental health (Brown, Vigod, et al. 2022b). There were fewer studies that examined mental health care access, utilization, or quality; the majority of studies focused only on time periods of reproductive health related to pregnancy and the postpartum.

Limitations of the review process used

There were some limitations with our systematic review process. Although we searched three databases using broad search terms related to disability, mental health, and reproductive health and conducted hand-searches of references of all included studies, it remains possible that studies were missed. We excluded qualitative studies, which would have provided more detailed information on the diversity of mental health-related issues, obstacles, and experiences faced by women with disabilities within the context of reproductive health. We also excluded studies that did not include a comparison group without disabilities or were conducted among populations in low- and middle-income countries, which narrows the scope of our findings. Reviews of reproductive and maternal health care experiences among women with disabilities in low- and middle-income countries report similar themes as those in high income countries, including negative attitudes and lack of support from family members; issues related to inappropriate communication, lack of training, and prejudicial attitudes among clinicians; and affordability, accessibility, and transportation barriers to health care (Casebolt 2020; Nguyen et al. 2019). Studies also report depression and anxiety around the time of pregnancy among women with disabilities in India (Murthy et al. 2014) and Vietnam (Nguyen et al. 2021). Considering that 80% of the global population with disabilities resides in low- and middle-income countries, we acknowledge the importance of not overlooking their health needs and experiences (Organization 2011; Saran et al. 2020). We also presented and interpreted results based on study-defined disability status, which allows for the possibility of exposure misclassification bias. This is particularly true for studies that defined

disability status using self-reported measures categorized as any versus no disabilities, which likely included women with self-reported mental health-related disabilities. Women with pre-existing mental health conditions are more likely to experience perinatal mental health issues (Brown, Vigod, et al. 2022b) so it is plausible that some reported associations may be exaggerated.

Conclusions

Evidence from this review suggests that women with disabilities are more likely to have poor mental health outcomes, including mental distress, diagnosed mental health disorders, and psychiatric-related healthcare visits, before, during, and after pregnancy compared to women without disabilities. Routine reproductive healthcare visits provide significant prevention and treatment opportunities where all women should be engaged in discussions of mental health, administered patient-appropriate screens, and provided with person-centered care and support. This is particularly critical for women with disabilities who continue to experience multiple barriers within healthcare settings, including discrimination, which only act to widen health inequities (Matin et al. 2021). Although this review focused on studies of populations in high income countries, it is likely that these findings are applicable to populations in low- and middle-income countries as well. Continued research in all settings is necessary to investigate and understand mental health outcomes and experiences during reproductive health time periods, especially understudied areas of menstruation, fertility, parenting, and menopause.

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Data availability Available upon request to senior author via email.

Declarations

Competing interests The authors disclose no financial nor non-financial interests that are directly or indirectly related to the work submitted for publication.

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