

Review

Women with Schizophrenia: Gender-Specific Needs, Migration Vulnerability, and Emerging Digital Approaches

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Abstract

Women in vulnerable living situations with schizophrenia face intersecting challenges, including migration-related trauma, caregiving burdens, and systemic barriers such as cultural dislocation, limited healthcare access, and stigma. These factors heighten vulnerability compared with men and contribute to delayed diagnoses, poor treatment adherence, and adverse outcomes. Advances in artificial intelligence (AI) and digital tools offer potential support, though they should be regarded as complementary rather than stand-alone solutions. This review synthesizes literature on gender-specific care for women with schizophrenia, examining clinical, social, and reproductive needs alongside the impact of migration and psychosocial adversity. Emerging models, including women-focused psychiatric units, perinatal services, and community therapeutic spaces, illustrate holistic approaches that integrate the medical, psychological, and social dimensions of care. Digital interventions, such as smartphone applications, mobile health tools, and digital participation strategies, are considered supportive extensions that offer opportunities to improve access, reduce costs, and enhance continuity of care. Despite this promise, digital tools remain under-validated for women in precarious contexts. Ethical challenges, including algorithmic bias, data privacy risks, and the exclusion of undocumented or marginalized groups, further constrain equitable implementation. This review aims to articulate conceptual linkages among gender, migration, and digital innovation in schizophrenia care, identifying thematic patterns, ethical tensions, and structural limitations in the existing literature. The synthesis provides a foundation for future hypothesis development and interdisciplinary research to advance inclusive and equity-driven mental health interventions.

Keywords: women with schizophrenia; gender-responsive care; migration and refugee vulnerability; psychosocial adversity; reproductive and perinatal mental health; community therapeutic space; digital mental health; artificial intelligence



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1. Introduction

Schizophrenia has long been recognized as a disorder that affects both men and women, yet its incidence, course, and social consequences often differ across genders. Early epidemiological studies described schizophrenia primarily as a disease of young men,

highlighting their earlier onset, poorer premorbid functioning, and more chronic course [1]. Later research, however, emphasized that women, while equally vulnerable, tend to present with later onset, stronger affective features, and better short-term social adjustment, though they remain highly burdened by reproductive, marital, and caregiving challenges [1]. Recent scholarship has further underlined that gendered social determinants play a critical role in shaping these trajectories. Women with schizophrenia face higher risks of childhood trauma, intimate partner violence, reproductive stigma, and housing instability, whereas men more commonly experience stigma related to employment and substance use [2]. These patterns illustrate that schizophrenia is not sex-specific in prevalence but deeply influenced by gender-specific vulnerabilities and social expectations [3].

Women with schizophrenia in vulnerable populations experience compounded risks shaped by trauma, economic disadvantage, cultural dislocation, and barriers to care [3]. These risks are especially pronounced among women who identify as migrants or refugees and those living in violent circumstances, where gender roles, social stigma, and systemic inequities intensify vulnerability. Compared with men and women in more stable environments, these groups face higher rates of psychosis, driven by limited social support, wage inequality, ongoing violence, precarious living conditions, language barriers, and restricted access to mental health services [3]. Research underscores the need for gender-responsive and culturally adapted care models that address these intersecting challenges, including mental health services during and after pregnancy, community-based therapeutic programs, and trauma-informed interventions [4,5].

One solution to developing gender-responsive care may be through artificial intelligence (AI). Although AI and digital tools are increasingly discussed in mental health, the research into their direct application to women with schizophrenia remains limited [4]. Currently, they should be viewed as complementary strategies with the potential to enhance access and engagement, rather than established stand-alone solutions [4]. This review, therefore, examines the unique vulnerabilities of women with schizophrenia in at-risk settings and evaluates clinical, structural, and social responses, while cautiously considering the emerging but still limited role of digital and AI-assisted care.

Women in vulnerable populations often face psychosocial adversity that undermines their ability to maintain well-being and care for their children [5]. In maternal health, vulnerability is defined as the need for additional support beyond standard antenatal care due to factors such as financial hardship, unstable housing, substance use, or mental health difficulties. Women themselves also highlight that vulnerability extends to risks for their children's health and development, underscoring the intergenerational impact of such adversity [3]. González-Rodríguez et al. [3] report that migrant women with schizophrenia are frequently underdiagnosed or misdiagnosed because of cultural misunderstandings, language barriers, and trauma-related masking of symptoms. Caregiving burdens and gendered trauma, including sexual violence and forced family separation, not only contribute to illness onset but also hinder engagement with clinical care. Stressors such as forced migration, caregiving under economic hardship, and exposure to violence intensify these risks, while stigma and fear of institutional exposure further discourage undocumented women from seeking help. These findings emphasize the need for gender-responsive, culturally sensitive approaches rather than reliance on standard psychiatric criteria alone [3]. Refugee women-at-risk frequently encounter substantial psychiatric symptoms that are exacerbated by trauma histories and post-migration difficulties, including systemic exclusion and language barriers. These factors often delay diagnosis and treatment, underscoring the potential of digital and AI-based approaches to offer earlier and more equitable access to care for this vulnerable group [6].

The Community Therapeutic Space (CTS), developed by Natividad et al. [4], constitutes a gender-specific model that integrates clinical and social support tailored to the unique needs of women with schizophrenia. Within this framework, the “Black Corner” addresses digitalization, emphasizing the importance of digital inclusion for facilitating access and participation in mental health services [4]. Empirical findings demonstrate that digital tools, such as smartphone applications and patient portals, can enhance communication with providers, increase adherence to appointments, and improve shared decision-making among individuals with severe mental illness [4]. The incorporation of digital strategies within CTS responds to the persistent digital divide, which has historically limited the participation of women with schizophrenia in care programs [4]. Although digitalization represents only one of the seven thematic “corners” of the CTS, its integration reflects the broader shift toward using technology to mitigate structural barriers to care and to promote engagement [4]. By embedding digital participation within a culturally adapted and gender-responsive framework, the CTS demonstrates how innovative interventions can advance holistic, equitable, and sustainable recovery pathways for women with complex psychosocial needs [4].

Within this context, the present review focuses on the current state of the needs of women with schizophrenia, how external factors shape these needs, and what kinds of new technologies can help address them. Specifically, this review seeks to explore the intersection of gender, migration, and digital innovation within schizophrenia care, with particular attention to how structural, cultural, and clinical dynamics affect service accessibility and quality for women in vulnerable contexts. Rather than evaluating intervention effectiveness, the review synthesizes existing multidisciplinary literature to identify emerging patterns, critical gaps, and conceptual pathways that warrant further empirical investigation. This integrative synthesis is intended to support the generation of future hypotheses and inform the design of gender-responsive, culturally sensitive, and digitally inclusive mental health interventions. Specifically, we will address the following:

1. The unique clinical, social, and care needs of women with schizophrenia as compared to men.
2. How migration and psychosocial adversity shape the vulnerability and mental health outcomes of women with schizophrenia or related conditions.
3. The gender-specific care models and digital or AI-supported interventions that have been developed to address the needs of women with schizophrenia.

2. Discussion

This discussion explores how gender, migration, and innovation intersect in shaping care for women with schizophrenia. Due to limited empirical evidence on AI for this group, the analysis is conceptual and hypothesis-generating. It examines gender-responsive care models alongside both AI-based and broader digital strategies, such as mobile apps and telepsychiatry, to identify gaps and guide future research and practice.

2.1. *The Unique Clinical, Social, and Care Needs of Women with Schizophrenia as Compared to Men*

Women with schizophrenia exhibit distinctive clinical, social, and care needs that diverge from those of men, underscoring the necessity of a gender-responsive approach in both diagnostic and therapeutic contexts [7]. Clinically, women tend to experience a later age of onset and display stronger affective and positive symptoms, whereas men are more likely to present with negative symptoms and earlier functional decline [7]. Women also demonstrate comparatively favorable responses to antipsychotic treatment, often requiring lower doses prior to menopause, a pattern linked to the protective effects of

estrogen [8]. However, reproductive transitions, such as pregnancy, the postpartum period, and menopause, create additional vulnerabilities, requiring adjustments in pharmacological regimens. This is because hormonal changes can exacerbate symptoms, alter drug metabolism, and complicate adherence [7].

Cultural context also influences diagnosis and treatment. Psychotic symptoms, including hallucinations and delusions, may be understood differently across cultures, sometimes regarded as normative rather than pathological [7]. This variation can lead to overdiagnosis or missed diagnoses depending on the clinician's perspective [7]. These cultural dynamics intersect with sex and gender differences, as illness incidence, expression, and outcomes are influenced by both biological mechanisms and social roles [7].

Beyond clinical presentation, the social contexts of women with schizophrenia shape outcomes in distinct ways [7]. Women often maintain broader social and familial networks, but these supports can be fragile when caregiving and maternal responsibilities intersect with psychiatric symptoms [7]. The study of Puerto Rican migrant women illustrates this vulnerability: women with schizophrenia were more socially isolated and had weaker informal networks compared to their non-schizophrenic counterparts, demonstrating how gender roles, migration, and illness converge to intensify risk [9]. Moreover, women frequently face stigma on multiple levels, including psychiatric labeling and gender-based discrimination, which restricts access to stable relationships, employment, and community support [9].

In terms of care, women require services that extend beyond traditional psychiatric management [3]. While antipsychotic therapy remains foundational, women with schizophrenia benefit significantly from integrative models that incorporate reproductive and perinatal mental health care, parenting support, domestic violence prevention, and targeted suicide risk reduction [3]. Specialized women's units, for example, provide holistic interventions that integrate clinical management with psychosocial and family-based support, thereby addressing not only medical stabilization but also social reintegration [3]. Such models address the double burden faced by women with schizophrenia, which encompasses biological and clinical complexities shaped by reproductive factors, alongside socially constructed vulnerabilities associated with caregiving roles, stigma, and structural inequities [3].

Community-based therapeutic models are vital in addressing the psychosocial and health needs of women with schizophrenia, particularly those facing socioeconomic exclusion and limited access to traditional services [3]. The Community Therapeutic Space (CTS), developed within the Mutua Terrassa Functional Unit for Women with Schizophrenia, integrates personalized care with health promotion and opportunities for social interaction, thereby addressing both medical and psychosocial dimensions of recovery [3]. The program includes individual appointments that consider both pharmacological and social factors, group sessions on healthy habits, and community-linked activities that promote engagement and participation [3]. These interventions are organized into thematic areas, including mindfulness, gynecological screening, access to natural environments, and digital health participation, with peer-to-peer and volunteer initiatives reinforcing routine behaviors and strengthening social connectedness [3].

Taken together, the evidence demonstrates that women with schizophrenia cannot be adequately served by generic, male-derived clinical frameworks [3]. Their recovery depends on comprehensive, gender-specific care models that address both the biological realities of illness expression and the cultural and social dynamics that shape lived experiences [3]. Without such approaches, women remain at heightened risk of misdiagnosis, ineffective treatment, and insufficient psychosocial support, perpetuating cycles of illness and marginalization [3].

In sum, the evidence supports the imperative for gender-responsive care models that integrate clinical, reproductive, and psychosocial dimensions, acknowledging the intersecting biological and sociocultural factors that shape illness trajectories among women with schizophrenia.

2.2. How Migration and Psychosocial Adversity Shape the Vulnerability and Mental Health Outcomes of Women with Schizophrenia or Related Conditions

These gender-specific needs are further intensified in contexts of migration and psychosocial adversity, where structural and systemic stressors exacerbate psychiatric vulnerability and complicate access to appropriate care, as explored in the following section.

Migration and psychosocial adversity significantly shape the experiences of women with schizophrenia, amplifying both clinical vulnerability and barriers to care [8]. The process of migration is often accompanied by family separation, social isolation, and economic precarity, all of which exacerbate psychiatric risk [8]. Bouris et al. [8], for example, found that migrant mothers in Canada who were separated from children due to migration reported higher rates of postpartum depression and anxiety. This demonstrates how maternal roles intersect with migration stressors to create unique mental health challenges for women. Similarly, Schweitzer et al. [6], in a study of 104 resettled refugee women in Australia, reported strikingly high levels of trauma, depression, anxiety, and somatization, findings that underscore the cumulative psychological toll of displacement, trauma histories, and post-migration living difficulties. Such evidence highlights that migrant women are often at the intersection of multiple vulnerabilities: gender, migration status, and psychiatric risk [6].

Cultural traditions and social expectations also mediate how migrant women with schizophrenia express psychiatric distress and engage with services. González-Rodríguez et al. [3] emphasize that women's clinical presentations are shaped not only by biological factors but also by cultural frameworks of distress, which influence symptom expression and help-seeking behavior. For example, idioms of distress, trauma-related speech disruptions, and culturally specific caregiving roles can complicate clinical assessment if diagnostic tools are not adapted to diverse populations. When women's voices and cultural experiences are overlooked, there is a heightened risk of misdiagnosis, delayed treatment, or inadequate care [3].

The structural dimensions of migration further exacerbate vulnerability. Refugee women-at-risk frequently encounter barriers to mental health services, including communication and linguistic difficulties, financial constraints, childcare responsibilities, and stigma associated with both psychiatric illness and migration status [6]. These barriers limit access to and continuity of mental health care, reducing treatment engagement and perpetuating cycles of distress and marginalization. Moreover, childcare responsibilities and precarious living conditions create additional psychosocial burdens, placing refugee women-at-risk at heightened risk of relapse and chronic illness [6].

Refugee women-at-risk often face compounded psychological vulnerabilities linked to pre-migration trauma, displacement, and gender-based violence, combined with post-migration challenges such as cultural dislocation, language barriers, and social isolation [6]. Symptoms of trauma, depression, anxiety, and somatization were closely tied to experiences such as sexual assault, imprisonment, and family separation, as well as ongoing difficulties like loneliness, disrupted family networks, and communication problems [6]. Having children further increased psychological strain by compounding social and caregiving responsibilities, while cultural unfamiliarity and disrupted networks intensified distress. These findings underscore the importance of culturally informed and gender-responsive approaches to mental health care for refugee women-at-risk [6].

International migration has increased significantly in recent decades, with over 125,000 women immigrating to Canada annually. Most of these women are in their child-bearing years, and many have given birth before migration [8]. Migration policies and economic constraints often result in prolonged family separation, particularly affecting women who migrate without their children. These “dual-country” (DC) mothers, women who gave birth in Canada after being separated from their children who remain in their home country, face a unique intersection of stressors, including emotional trauma from separation, adaptation challenges in new sociocultural environments, and limited access to healthcare and social support [8]. Many DC mothers faced elevated risks of postpartum depression, anxiety, and trauma-related symptoms, shaped by expectations of maternal duty, emotional strength, and barriers to care access [8].

They were also significantly more likely to experience poverty, social isolation, and food insecurity, all of which further strained mental health [8]. Compared to non-DC migrant mothers, DC mothers were more likely to face structural disadvantages: poverty (36.0% vs. 18.6%), food insecurity (16.3% vs. 7.6%), lack of a partner (40.2% vs. 11.4%), and absence of social support (23.1% vs. 12.2%). Additionally, over 83% of DC mothers were asylum seekers or refugees, increasing their vulnerability. These factors were linked with higher rates of postpartum depression (28.3% vs. 18.6%), clinical depression (23.1% vs. 13.5%), and trauma-related anxiety (16.5% vs. 9.4%) [8].

Collectively, the evidence demonstrates that migration and psychosocial adversity compound the vulnerabilities of women by amplifying trauma exposure and psychiatric distress, while family separation, poverty, and structural barriers further restrict access to appropriate mental health care [6,8]. Effective treatment, therefore, requires interventions that are responsive to the combined effects of trauma, migration-related family separation, poverty, and limited social support, ensuring that care addresses both the clinical and structural challenges faced by migrant women [6,8]. Gender-specific needs are magnified by migration-related trauma, and digital tools may mitigate access barriers in this context.

Taken together, the literature highlights that migration-related trauma, structural inequities, and cultural displacement significantly intensify the psychiatric vulnerability of women with schizophrenia. These compounded stressors demand mental health interventions that are both clinically grounded and culturally adaptive, tailored to the lived realities of migrant and refugee women navigating complex psychosocial environments.

2.3. The Gender-Specific Care Models and Digital or AI-Supported Interventions That Have Been Developed to Address the Needs of Women with Schizophrenia

In response to these intersecting challenges, emerging care models have begun to incorporate gender-specific frameworks and digital innovations. The following section examines how clinical programs and AI-supported interventions are evolving to better address the multifaceted needs of women with schizophrenia, particularly in vulnerable or underserved populations.

Recent scholarship emphasizes the necessity of gender-specific care models for women with schizophrenia, as generic, male-derived approaches fail to address reproductive, psychosocial, and cultural vulnerabilities [10]. González-Rodríguez et al. [10] describe a specialized clinical unit in Spain that integrates psychiatric treatment with reproductive and social healthcare. The program combines therapeutic drug monitoring, perinatal services, suicide prevention, family and group therapy, and specialized social services addressing parenting, domestic abuse, and sexual exploitation [11]. Planned extensions include occupational therapies, home-based services, and psychoeducation for patients and families, making the program one of the most comprehensive gender-focused care frameworks currently in place [10]. These specialized units explicitly target risks unique to

women, including perinatal relapse, custody loss, and victimization, domains frequently neglected within mixed-gender psychiatric services [2].

Complementing clinic-based models, digital and AI-supported interventions are emerging to expand access to care. Natividad et al. [4] describe the White Corner as incorporating mindfulness-based interventions, which have been associated with reductions in psychotic symptoms, improvements in cognitive functioning, and decreased stigma among individuals with schizophrenia. Natividad et al. [4] explain that the Black Corner addresses digitalization, highlighting that smartphone applications and other digital tools can improve access to care, enhance patient activation, support shared decision-making, increase adherence, and strengthen communication with providers. At the same time, Natividad et al. [4] acknowledge that the digital divide remains a significant barrier, particularly for women with limited access to technology or the internet. Thus, equitable digital inclusion is critical. Moreover, they highlight that digital strategies should be integrated within community and peer-support programs to sustain recovery and enhance social participation [4].

González-Rodríguez et al. [2] emphasize that schizophrenia research and treatment guidelines have historically been based on male-oriented data, often overlooking sex- and gender-specific differences. This selection bias limits the applicability of findings to women unless validated with gender-sensitive approaches. Beyond highlighting sex selection bias, González-Rodríguez et al. [2] point out that women respond differently to antipsychotic treatment across the life course, with estrogen conferring protection before menopause but a loss of efficacy and greater side effects afterward. To address these disparities, they advocate for specialized women-focused clinical units and insist that future trials must ensure balanced recruitment, report sex-disaggregated outcomes, and systematically account for hormonal and reproductive factors to produce reliable and equitable treatment guidelines [2].

In addition, González-Rodríguez et al. [2] describe gender-focused interventions such as home-based services designed to extend care into the community, particularly for postpartum women, survivors of domestic abuse, and those with difficulties adhering to treatment. These initiatives highlight the need to complement clinic-based models with flexible, community-oriented strategies that address women's reproductive, psychosocial, and adherence-related vulnerabilities. González-Rodríguez et al. [2] highlight that peer support interventions during the perinatal period can play a critical role in preventing relapse and reducing isolation. They also emphasize that occupational therapy should be adapted to the different stages of women's reproductive life, enhancing both social participation and cognitive functioning [2]. San Miguel et al. [12] conducted a systematic review to examine the application of artificial intelligence (AI) and virtual reality (VR) in the treatment of women with schizophrenia. Their work emphasizes that women face distinct vulnerabilities, including reproductive health factors, hormonal fluctuations, and psychosocial stressors, which are often overlooked in treatment models largely derived from male populations [12]. To address this research gap, they searched PubMed and Scopus databases from inception to September 2023, identifying 320 potentially relevant studies, of which only six met the inclusion criteria requiring explicit reporting of women's treatment response and the use of AI or VR methodologies [12].

The findings highlighted three main domains of AI application. First, predictive modeling studies demonstrated that machine learning techniques could successfully integrate genetic risk scores and proxy methylation markers to forecast treatment trajectories for women with schizophrenia [12]. Second, in pharmacovigilance, AI was able to connect prolactin levels with response to olanzapine, providing insights into the relationship between medication, endocrine side effects, and adherence in women [12]. Third, in the

context of treatment-resistant schizophrenia, statistical learning approaches showed that women responded more favorably to clozapine than men, although paradoxically they were prescribed this medication less frequently even after adjusting for sociodemographic and clinical factors [12]. This discrepancy illustrates how AI methods can both reveal systemic inequities in prescribing and support more evidence-based, gender-sensitive clinical decision-making [12].

The review concluded that AI has begun to demonstrate concrete potential to enhance treatment prediction and optimization for women with schizophrenia, but current applications remain limited in scope [12]. Importantly, innovative approaches such as digital twin simulations have not yet been applied to women with schizophrenia, underscoring the need for future research to develop personalized interventions that integrate biological, psychological, and social dimensions of care [12]. Taken together, the literature highlights two complementary strategies: the development of specialized clinical units that embed reproductive, psychosocial, and cultural needs within psychiatric care, and the use of digital tools that can expand access, improve communication with providers, and strengthen long-term engagement for women with schizophrenia [2,4]. The future of equitable treatment lies in hybrid models that integrate face-to-face, gender-responsive services with culturally adapted and gender-validated digital innovations tailored to women's clinical and social realities [2,4].

In sum, gender-specific care models and emerging digital tools offer complementary pathways to address the complex needs of women with schizophrenia. While clinical programs provide integrated, reproductive-sensitive support, AI applications hold promise for enhancing personalization and access. Future progress depends on validating these innovations through gender-responsive research.

3. Methods

This study adopts a narrative literature review methodology. As noted by Sukhera [11], narrative reviews differ from systematic reviews in that they allow flexibility in the selection of sources, prioritizing a broader understanding of diverse perspectives over strict inclusion or exclusion criteria. Rather than aiming for exhaustive coverage, narrative reviews focus on generating meaningful interpretations shaped by the researchers' contextual, institutional, or historical lenses. Additionally, narrative reviews are more suitable for research that is emerging and focused on vulnerable populations, such as the present review, which focuses on women with schizophrenia and AI-specific approaches. Grounded in interpretivist and subjectivist traditions, this approach is well-suited for exploring the nuanced dimensions of emerging educational innovations. It also supports the ongoing refinement of research questions and scope throughout the review process, enabling responsiveness to the evolving nature of the topic [11]. Accordingly, this review draws from peer-reviewed sources accessed through ERIC, EBSCOhost, PsycINFO, and PubMed, with a particular emphasis on literature that explores the unique circumstances of women with schizophrenia.

These databases were selected for their relevance to interdisciplinary research spanning psychiatry, education, gender studies, and digital innovation. The search strategy focused on peer-reviewed, English-language sources that addressed at least two of the core thematic areas: schizophrenia, gender, migration, and digital technology. Although narrative reviews do not require strict inclusion or exclusion criteria, the relevance of each study was evaluated based on its conceptual alignment and contribution to the research objectives.

3.1. Boolean Search Strategy

Given the narrative design, we report SANRA scores and provide complete Boolean strings and screening counts by database to enhance transparency. A systematic Boolean

search strategy was applied to identify relevant literature for this review. The search focused on three major concept clusters: artificial intelligence and digital interventions, schizophrenia and related psychoses, and women in vulnerable situations or migrant populations. Within each cluster, synonyms and related terms were linked using the “OR” operator, while the clusters themselves were combined using “AND” to ensure that all results reflected the intersection of these themes. For example, terms such as “Artificial Intelligence” OR “AI” OR “Machine Learning” OR “Digital Health” were paired with “Schizophrenia” OR “Psychosis” OR “Severe Mental Illness” by using the “AND” operator and further refined with “Women” OR “Female” OR “Migrant” OR “Refugee” OR “Undocumented Women”. Additional operators such as NOT were used to exclude irrelevant studies, for instance, “Schizophrenia AND Women NOT Dementia” or “AI AND Psychosis NOT Children”. Truncation symbols (e.g., *schizo*) and phrase searching with quotation marks (e.g., “migrant women”, “digital mental health”) were also employed to increase precision. This structured approach ensured a balance between breadth and specificity, enabling the identification of literature that addressed women with schizophrenia, migration-related vulnerabilities, and other relevant issues, as well as emerging digital or AI-supported interventions published between 2000 and 2025.

3.2. Inclusion and Exclusion Criteria

The studies included in this review were selected according to explicit inclusion and exclusion criteria to ensure relevance and rigor. Articles were included if they: (a) were published between 2000 and 2025, (b) were peer-reviewed and available in full text in English, and (c) addressed women with schizophrenia, with particular focus on gender-specific clinical or social needs, migration or vulnerability, or interventions including digital and AI-supported approaches. Both qualitative and quantitative studies, as well as systematic and narrative reviews, were eligible if they contributed directly to understanding the experiences or care of women with schizophrenia.

Articles were excluded if they: (a) did not differentiate findings for women or gender-specific subgroups, (b) focused exclusively on other conditions such as dementia or bipolar disorder without explicit relevance to schizophrenia, (c) examined child or adolescent populations without adult women, (d) were not peer-reviewed (e.g., opinion pieces, commentaries, conference abstracts), or (e) were published in languages other than English. Studies that addressed digital interventions or AI tools in general mental health, but without clear relevance to women with schizophrenia or migrant/vulnerable populations, were also excluded. Table 1 summarizes the studies reviewed, outlining their purposes, key findings, and limitations. Together, these studies highlight the unique clinical and social needs of women with schizophrenia, while also revealing gaps such as small samples, limited cultural scope, and a lack of longitudinal evidence.

Table 1. Summary of the studies reviewed.

Author(s) (In-Text)	Purpose	Findings	Limitations
(Bouris et al., 2012) [8]	To examine the mental health of migrant women after childbirth	Migrant women reported higher postpartum depression and anxiety, linked to separation and trauma	Small sample of asylum-seeking/refugee mothers; non-diagnostic tools; limited generalizability
(Garrison, 1978) [9]	To compare the support systems of Puerto Rican migrant women with and without schizophrenia	Women with schizophrenia had weaker informal networks and limited support compared to non-schizophrenic women	Very small, culturally specific sample in NYC; dated context

Table 1. Cont.

Author(s) (In-Text)	Purpose	Findings	Limitations
(González-Rodríguez et al., 2023) [2]	To review gender differences in schizophrenia and propose women-focused clinical models	Identified unique female needs (perinatal mental health, suicide prevention, and lower substance use) and recommended specialized women's units	Conceptual review; no empirical validation
González-Rodríguez et al. (2023) [10]	To review male vs. female care needs in schizophrenia and describe a new specialized women's unit in Spain.	Identified key differences in symptom profiles, treatment response, and social outcomes between men and women. Developed a specialized clinical unit offering drug monitoring, perinatal services, suicide prevention, social services, and family-based interventions.	Many trial outcomes and guidelines are male-focused; limited reporting of women's hormonal status (pre/post-menopause); some planned interventions (e.g., pharmacogenetic testing, occupational therapy) not yet implemented.
(González-Rodríguez et al., 2024) [3]	To synthesize migration, gender–and schizophrenia literature and propose the CTS model	Emphasized cultural adaptation, stigma reduction, and digital health inclusion for migrant women with schizophrenia	Narrative review; not empirically tested in diverse sites
San Miguel et al. (2024) [12]	To systematically review the use of artificial intelligence (AI) and virtual reality (VR) in predicting clinical response and supporting treatment for women with schizophrenia.	Identified 6 relevant studies. AI and ML models improved prediction of treatment response (using clinical, genetic, and graph-theory measures), supported therapeutic drug monitoring (e.g., quetiapine levels), and connected prolactin levels to treatment response. Women with treatment-resistant schizophrenia responded better to clozapine but received it less frequently.	Few studies specific to women; small sample sizes; digital twins not yet applied; limited diversity across study populations; findings remain preliminary and not yet integrated into routine clinical care.
(Natividad et al., 2025) [4]	To describe the implementation of CTS for women with schizophrenia in Catalonia	CTS enhanced empowerment, mindfulness, and inclusion of women's health services	Accessibility issues; specialized expertise required; limited evaluation
(Schweitzer et al., 2018) [6]	To assess the psychiatric health of refugee women-at-risk	High rates of PTSD, depression, anxiety, and somatic symptoms; loneliness and boredom worsened outcomes	Cross-sectional; small, heterogeneous sample; interpreter bias
(Seeman, 2020) [7]	To review schizophrenia presentation and treatment in women	Women showed a later onset, better prognosis, and lower substance use, highlighting unique treatment needs	Secondary review: limited RCTs on women-only schizophrenia
(van der Meer et al., 2024) [5]	To explore perceptions of vulnerability among pregnant/postpartum women	Women defined vulnerability as loss of control and risks for the child; stigma from labeling was noted	Only 10 women; already receiving care; limited transferability

Table 2 summarizes gender-specific studies on women, schizophrenia, and vulnerability, highlighting their scope, participants, and interventions. The findings show consistent links between gendered adversity and mental health needs, with limited but emerging attention to digital inclusion through models such as the Community Therapeutic Space (CTS).

Table 2. Gender-Specific Studies on Women, Schizophrenia, and Vulnerability.

Author(s) (In-Text)	Type and Scope	Participants/Background	Schizophrenia Patients?	Intervention/Digital Use
(González-Rodríguez et al., 2023) [10]	Review—Global	Synthesized literature on gender differences in schizophrenia	Yes	Proposed women-focused clinical unit: therapy, perinatal care, suicide prevention; no digital
González-Rodríguez et al. (2023) [2]	Narrative review; focus on male vs. female care needs	Literature review and description of a specialized women’s unit in Spain	Yes—focus on women with schizophrenia	Unit includes therapeutic drug monitoring, perinatal services, suicide prevention, social/parenting support, peer support, and planned digital health monitoring
(González-Rodríguez et al., 2024) [3]	Narrative Review—Global focus, applied in Spain	Migrant women with schizophrenia	Yes	Community Therapeutic Space (CTS): empowerment, psychoeducation, mindfulness, digital health inclusion
(Seeman, 2020) [7]	Review—Global	Global synthesis on schizophrenia psychosis in women	Yes	Gendered differences in onset, treatment needs, outcomes; no digital
(Bouris et al., 2012) [8]	Canada (Empirical)	Migrant women post-birth	No (maternal/postpartum focus)	Maternal mental health support programs; no digital
(Garrison, 1978) [9]	USA (NYC, Empirical)	Puerto Rican migrant women	Compared schizophrenia vs. non-schizophrenia	Examined social support systems; no direct intervention
San Miguel et al. (2024) [12]	Systematic review (PRISMA) on AI and VR in women with schizophrenia	320 abstracts screened; 6 studies included	Yes—women with schizophrenia (treatment response, TRS)	AI/ML models for prediction (genetic + clinical data), therapeutic drug monitoring (e.g., quetiapine), pharmacovigilance, clozapine response; VR tools mentioned but limited application
(Natividad et al., 2025) [4]	Spain (Catalonia, Empirical)	Women with schizophrenia in a specialized unit	Yes	CTS model: lifestyle groups, gynecological care, mindfulness, digital/health apps
(Schweitzer et al., 2018) [6]	Australia (Empirical)	104 resettled refugee women-at-risk	Mixed (some schizophrenia, mostly trauma/PTSD)	Psychiatric assessment; no digital
(van der Meer et al., 2024) [5]	Netherlands (Empirical)	11 pregnant/postpartum women facing psychosocial adversity	No (not schizophrenia-specific)	Qualitative exploration of vulnerability and care pathways; no digital

4. Review Process

Article selection began with screening the title, abstract, and conclusion for alignment with the predetermined review criteria. Duplicate entries were then deleted, and the remaining articles were subjected to a detailed full-text appraisal for relevance to the focus of the review. A total of 10 studies were finally included. The narrative appraisal was informed by the SANRA scale (Scale for the Assessment of Narrative Review Articles), created by Baethge et al. [13], a six-point scale designed to assess non-systematic narrative reviews. SANRA assesses crucial dimensions, including the clarity of aims, the search strategy, citation standards, the rationality of argument, and the inclusion of relevant supporting information. Each element receives a score on a scale ranging from 0 (low) to 2 (high), for a total score of 12. The tool’s initial validation showed acceptable internal consistency

(Cronbach's $\alpha = 0.68$) and inter-rater agreement (ICC = 0.77) [13]. The SANRA tool was used not as a rigid scoring mechanism for exclusion but rather as a guide to ensure that included articles met a minimum threshold of narrative quality and scholarly relevance. Articles scoring low on key indicators, such as unclear aims, lack of coherence, or insufficient referencing, were critically discussed by the authors before being included. This approach ensured consistency with the interpretivist framework of the review, while maintaining methodological transparency and academic rigor appropriate to narrative synthesis.

5. How This Review Contributes New Insights

This narrative review presents a distinct and integrative contribution by examining how gender, migration, and digital innovation interact to shape the experiences of women living with schizophrenia. Although existing literature has addressed these dimensions individually, few studies have attempted to synthesize them within a unified analytical framework. This review fills that gap by offering a critical intersectional perspective that accounts for structural, cultural, and technological determinants of mental health care access and outcomes.

Building on prior work, including reviews by González-Rodríguez and colleagues, the current synthesis extends the scope of gender-sensitive research by explicitly incorporating the socio-political realities of migration and the emerging role of digital tools in psychiatric care. Rather than treating these elements as peripheral or additive, the review positions them as central to understanding disparities in diagnosis, treatment engagement, and continuity of care among diverse female populations.

Importantly, the review foregrounds the concept of digital exclusion, not merely as a technological gap, but as a structural barrier that intersects with gendered and racialized inequalities. This approach enables a more nuanced understanding of how digital health strategies can either mitigate or exacerbate existing disparities. In addition, by integrating literature from clinical psychiatry, digital health, migration studies, and gender theory, the review introduces a transdisciplinary approach that offers both conceptual innovation and applied relevance.

Through this synthesis, the review proposes a framework for care that is not only clinically informed but also culturally responsive and digitally inclusive. This contributes to the evolving discourse on equitable mental health systems by emphasizing the need for tailored interventions that recognize the compounded vulnerabilities experienced by migrant women with schizophrenia. The insights generated here aim to inform future empirical studies, guide the development of inclusive digital mental health tools, and support policy reforms grounded in principles of gender equity and social justice.

6. Limitations of the Current Review

This review offers valuable insights into the experiences and care needs of women with schizophrenia, but certain limitations must be acknowledged. Although most studies examined were gender-specific to women, several addressed broader concerns such as refugee status, perinatal mental health, or psychosocial adversity rather than schizophrenia itself. Only a small number directly evaluated digital or AI-supported interventions relevant to this population, and no study provided conclusive evidence on their clinical effectiveness for migrant women with schizophrenia. Much of the existing evidence is drawn from general mental health studies, limiting its applicability to women with schizophrenia in vulnerable or migration-related contexts. Many of the included works relied on small samples, conceptual frameworks, or narrative syntheses, resulting in a limited body of empirically validated evidence.

The reliance on a narrative review design presents further limitations. While narrative reviews enable broad synthesis and contextual interpretation, they are susceptible to selection bias, limited transparency in inclusion criteria, and variability in author interpretation. Quality assessments confirm that such reviews vary widely in rigor and reliability, underscoring the need for critical appraisal tools such as SANRA to strengthen reporting standards [8]. Unlike systematic or meta-analytic approaches, narrative reviews do not claim exhaustive coverage, and different reviewers may reach different conclusions. This may contribute to a disconnect between conceptual aims and the empirical evidence currently available, especially in relation to emerging digital innovations. Structural and ethical challenges, including cultural bias, exclusion of undocumented women, and inequities in digital access, also remain insufficiently explored. Future research should explicitly investigate AI-driven tools within gender- and migration-sensitive frameworks and complement narrative syntheses with systematic or mixed-method approaches to ensure greater empirical clarity and applicability.

7. Suggestions for Future Research

Future studies should investigate interventions that address the specific clinical and social needs of women with schizophrenia, particularly those shaped by reproductive stages, caregiving responsibilities, and experiences of migration or displacement. Research should evaluate gender-sensitive psychiatric services, including perinatal programs, women-focused treatment units, and community-based therapeutic models across different cultural settings. Hybrid approaches that integrate psychosocial support, reproductive health care, and trauma-informed practices with appropriately adapted digital tools also warrant exploration. Rather than assuming the applicability of generalized technologies, future work should formulate and test hypotheses around the potential effectiveness of culturally and linguistically responsive tools, such as multilingual mobile health applications or digital psychoeducation platforms, in enhancing engagement and continuity of care. Participatory designs that incorporate the perspectives of women, particularly refugees, asylum seekers, and undocumented populations, will be essential to generating interventions that are equitable, context-sensitive, and empirically grounded in lived experience.

8. Conclusions

Digital approaches offer significant promise in improving mental health care for marginalized populations, including migrant women with schizophrenia, who often face compounded barriers related to language, culture, trauma, and systemic exclusion. The literature suggests that women's experiences of schizophrenia are shaped by distinctive clinical and psychosocial trajectories, including reproductive transitions, caregiving responsibilities, and exposure to gendered violence. Migration further intensifies these vulnerabilities, underscoring the importance of contextually grounded, gender-responsive care. While models such as women-focused units and therapeutic community spaces offer more inclusive pathways, the integration of digital and AI-enabled interventions remains insufficiently developed and largely untested for this population. This review identifies emerging frameworks and conceptual directions but acknowledges the limited empirical evidence available to date. Accordingly, the review contributes to the formulation of future research hypotheses by mapping intersections among gender, migration, and digital innovation in mental health. Advancing this field will require interdisciplinary research that rigorously examines how digital tools can equitably support women with schizophrenia in diverse and vulnerable contexts.

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