

Prevalence of neuropsychiatric presentations in women who have been unable to access abortions.

Abstract

Rationale

It has often been theorised that restricting access to legal abortion could have a positive impact on society as a whole. With recent emerging legislation reinforcing these beliefs, it begs the question how women seeking this procedure will be affected.

Objectives

To systematically review the literature assessing the prevalence of neuropsychiatric conditions in relation to access to abortion to determine if there is a significant relationship.

Methods

The literature was searched using Ovid Medline, PubMed and Google Scholar yielding three appropriate primary study papers to include in this review which satisfied the inclusion criteria. Literature appraisal was performed using the appropriate Critical Appraisal Skills Programme frameworks.

Conclusion

There may be a modest relationship between legal access to abortion and mental health presentations in women.

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1. Introduction

Termination of pregnancy can happen for a number of reasons. In the UK, as stated in the Abortion Act 1967, induced termination of pregnancy is permitted under certain circumstances (About abortion in Britain, 2001). Two doctors must agree that the conditions are met before the abortion can be carried out. Under section 1 of the Abortion Act 1967, an abortion is allowed if (a) the pregnancy has not exceeded the twenty-fourth week and the continuance of the pregnancy would involve greater risk to either the woman or the existing family of the woman than if the pregnancy was terminated; (b) the pregnancy presents risk of grave permanent injury to the woman; (c) the pregnancy presents risk to the life of the woman; (d) there is substantial risk that the baby would be born with severe physical or mental disability (Legislation.gov.uk, 1979).

In June 2022, the Supreme Court of the US reversed the decision made in Roe vs Wade in 1973 (Kulczycki A, 2022). This had a detrimental effect on the access to women's healthcare not only in the US, but internationally. As a result of this overturn, notably there have been many asking questions of how this decision and the overall inaccessibility of abortion have affected individuals on a psychological level (Coen-Sanchez K, 2022). The US is not the only country subject to abortion laws, with many other countries across the world having completely banned abortion. The worldwide debate to many is a philosophical question, but to many others, and especially healthcare professionals across the world, this issue holds concerns of the physical, psychological and social consequences that denied abortion can have (Odum T). Thus, abortion laws can not only be seen as a political issue, but also a healthcare inequality, perhaps leading to certain groups of people developing conditions that others will not.

Many studies have been carried out since the introduction of the Abortion Act 1967 highlighting the psychological impacts women face after receiving an abortion, however, even when evidence has been published alongside, the conclusions drawn can often be biased by out-dated ideological beliefs (Dwyer JM, 2008). When abortion is claimed to cause the adverse effects on mental stability, there are often other factors not stated that can impact these outcomes, for example, relationship status, socio-economic status, partner violence, substance abuse or lack of support to name a few (van Ditzhuijzen J, 2018). Another study illustrating a similar narrative explored women's feelings for only one week after an abortion was performed and therefore is questionable to conclude the lasting negative effects of the procedure (Rocca CH, 2013). Despite the significant number of studies evaluating the mental harm of abortion, there are a lot fewer researching how abortion denial can affect well-being, and so this review will focus on studies evaluating that question.

2. Review question and literature searches

Defining the question

The question assesses the link between access to abortion and the possible neuropsychiatric presentations that may evolve because of this, and by extension, the clinical need for up to date laws and guidelines for women's health. The question was defined using the PICO (population, intervention, comparator, outcome) framework (Schardt C, 2007). I have limited the population to adults because the mental strain of pregnancy can differ with younger girls, especially because a high number of teen pregnancies are due to rape, and with this comes its own plethora of trauma and mental health issues. One study estimated that sixty percent of first pregnancies in teenagers are preceded by experiences of sexual assault (Center for American Progress, 2023). Studies are included if they compare the long-term impacts of being denied abortion, for whatever reason. Some of these include legislation, family pressure, and failure of the involved healthcare professionals to give unbiased opinions and referrals. Here, development of a neuropsychiatric condition includes any form of harm to the patient's mental well-being that is thought to arise as a direct cause from being denied the procedure they wanted to terminate their pregnancy.

Population	Adults who have been pregnant
Intervention	Abortion
Comparator	Unable to access abortion
Outcome	Development of a neuropsychiatric condition

Table 1: The review question framework

The clinical relevance of the question

As already stated in the introduction, abortion laws are recently changing, and it is not yet clear whether this is for the best. The case of a forty-four-year-old mother of three being sentenced to twenty-eight months in prison after taking abortion pills ten weeks after the UK legal limit perhaps demonstrates the need for decriminalising abortion (University of Liverpool News, 2023). The lasting impacts of forced pregnancy can be detrimental to a woman's health, both from physical trauma as well as psychological, especially with higher levels of stigma often seen in areas with more controlled abortion laws. Furthermore, access to abortion is connected to much larger problems in our society, most importantly of women's rights, autonomy, and empowerment (Hyatt EG, 2022). Therefore, any changes to abortion laws could impact mental health not only in women wanting termination of pregnancy, but, maybe to a smaller extent, in all women of the general population who face the stigma and consequences that such legislation implants into our society.

Review inclusion and exclusion criteria

See Table 2, the criteria used for selecting studies to review to ensure the most accurate and robust results, and the rationale behind this.

Study criteria	Rationale
In English	The author did not have the resources to translate studies accurately.
About humans	The question illustrates outcomes for women and there is enough literature out there to exclude studies done on animals that may be inaccurate because of species differences.
Analysis of each article consistent with the study question	Using the PICO framework, all components of the study must match the question to ensure the papers can be compared reliably.
Studies published after 2017	This was to ensure all data is up to date.
Material type: review articles or clinical trials	Only studies have been included to ensure no personal opinions or biases skew the results of the review.
Age of participants over eighteen	A high number of teen pregnancies have been associated with sexual assault and would therefore be unclear which event was more responsible for the development of a neuropsychiatric condition.
Only quantitative studies	Despite the high number of qualitative studies available on the subject question, quantitative studies have a higher level on the hierarchy of evidence, leading to more accurate results.
The main outcome measured was psychological health	This was to ensure the studies were comparable.

Table 2: The inclusion criteria for studies used alongside justifications

Primary study searching

Ovid Medline, Google Scholar and PubMed were used as databases for the search to ensure a wide range of sources were checked. See Table 3 for the search strategies.

Database	Search strategies	Limits
Ovid Medline	<ol style="list-style-type: none"> 1. (Depression or “depressive disorder” or anxiety or “mental health”).ti.ab. 2. (Women or females or girls or person or lady).ti.ab. 3. (Abortion or termination).ti.ab 4. 1 AND 2 AND 3 5. NOT (post or after) 6. Limit 5 to yr – “2015 – current” 	Limit to English language. See search item 5, 6
Google scholar	<ol style="list-style-type: none"> 1. (intitle:depression or anxiety or mental health or psychological) 2. (intitle:abortion or termination) 3. 1 AND 2 4. Limited 3 to ‘human’ 	See search item 4 Limited articles from 2015 onwards
PubMed	<ol style="list-style-type: none"> 1. (Depression or “depressive disorder” or anxiety or “mental health”).ti.ab. 2. (Women or females or girls or person or lady).ti.ab. 3. (Abortion or termination).ti.ab 4. 1 AND 2 AND 3 5. NOT (post or after) 6. Limit 5 to yr – “2015 – current” 	Limit to English language. See search item 5, 6

Table 3: Primary study search protocol

Interchangeable words and phrases are exploded in Table 4. This was used throughout the searching process to ensure nothing was missed.

Neuropsychiatric conditions	Women	Abortion	Unable to access
Depression Depressive disorder Anxiety Mental health Bipolar disorder Major depressive disorder Psychological Mental well being Mental stability	Females Girls Person Lady	Termination Aborticide Foeticide	Denied Deny Unobtainable Inaccessible Unavailable

Table 4: Synonyms used for the search protocol

As seen in Figure 1, Google Scholar yielded 36 results, Ovid Medline yielded 33 results, and PubMed yielded 43 results. Of those, 19 were duplicates and were removed. After the title and abstract screen, only 9 were suitable for review of this question. After reviewing the entire study, 5 were removed for lack of relevance or type of study. After removing the 1 study for being published before 2017, 3 studies were included for critical appraisal.

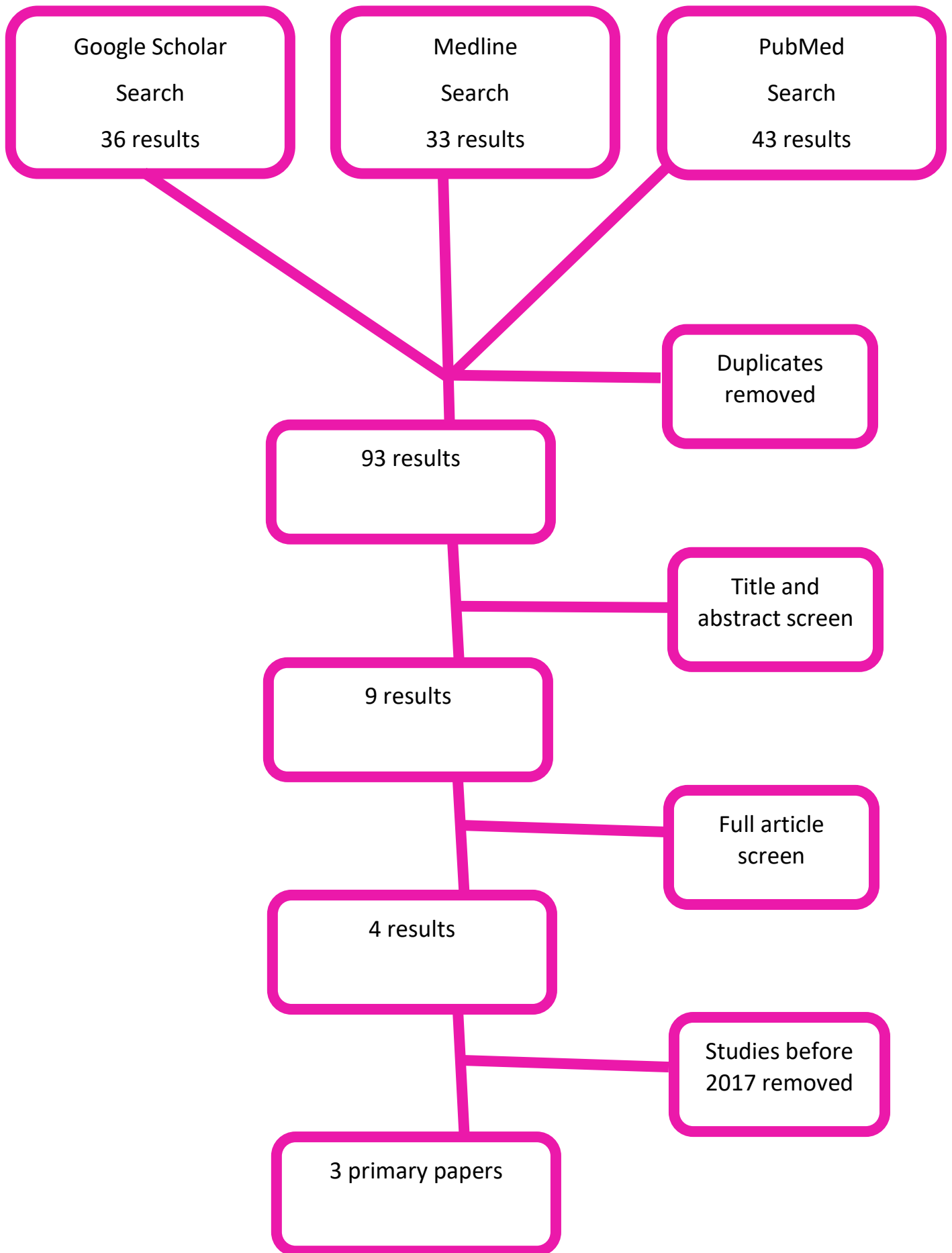


Figure 1: Flowchart illustrating the selection of primary papers

3. Review findings

	Biggs et al. 2017	Rajkumar et al. 2022	Yan Liu et al. 2023
Aim	To assess the well-being of women five years after being denied an abortion.	To assess the associations between access to legal abortion and the prevalence of common psychological presentations.	To examine whether living in states with restricted abortion access and reproductive rights affect mental health.
Study design	Prospective longitudinal cohort study.	Cross sectional and longitudinal study.	Cross sectional study.
Population and setting	Women from 30 clinics across 21 states throughout the US were sought. They compared women who were beyond the gestational limit of abortion with women who received an abortion.	Women from 197 countries with a selection of people living where there were differing abortion policies.	Surveys were collected from all 50 states of the US, including areas with legal access to abortion and areas that did not.
Methodology	They interviewed the turn away and control groups semi-annually for five years.	Changes to abortion policy and prevalence of psychological disorders were examined.	Data was used from the surveys and merged for multilevel logistic regression analysis.
Outcomes measured	Two measures of depression, two measures of anxiety, and a measure for self-esteem and for life satisfaction.	Prevalence of depression and anxiety disorders in all women of childbearing age for each country.	Frequency of mental health distress including stress, depression and problems with emotions.
Results	The turn away group experienced more adverse	There may be an indirect causality link between access	Abortion rights may contribute to mental health

	psychological outcomes initially.	to legal abortion and mental health disorders in women of the childbearing age group.	disorders, however, results differed with age and socioeconomic status.
Sample size	956	Not stated.	185,825

Table 5: Primary study main features summary (Biggs MA, 2017), (Rajkumar RP, 2022), (Liu SY, 2023)

Results

The Biggs et al. study found that depression symptoms declined significantly in the control groups compared to the turn away group and the latter had also significantly more anxiety symptoms (0.57; 95% CI, 0.01-1.13) and fewer cases where anxiety declined over time (Biggs MA, 2017). Self-esteem was found to be significantly lower in the turn away group (-0.33; 95% CI, -0.56 to -0.09) and significantly lower levels of life satisfaction (-0.41, CI -0.77 to -0.06). However, there were improvements of overall well-being over time in all groups. The p-value and confidence interval range appear reasonably precise.

The Rajkumar et al. study used several methods to analyse the data they had collected (Rajkumar RP, 2022). On post-hoc testing, they found that there was no significant difference between groups despite there being a trend towards lower incidence of mental health conditions in women of child bearing age in countries with fewer restrictions on abortion. However, when they used a dichotomous classification for abortion rights (restricted or broad access), as well as a six-category classification, they found that broader access to abortion was negatively correlated to incidence of depression. These results were true for both 2010 and 2019, and though the correlations were small ($\rho = -0.17$, $p = 0.017$), their results remained statistically significant after performing analysis for covariance.

The Yan Liu et al. study found no association between reproduction rights and frequency of reports of mental distress, though after adjusting their results for cofounders, they found a significant decrease of reported mental distress with a higher reproductive right score (Liu SY, 2023). After analysis, their results indicated that women who lived in states with restricted abortion access were more likely to report frequent mental health distress (OR = 1.29, 95% CI = 1.11, 1.50). The p-value and confidence interval range appear reasonably precise. They also stated the differences in results due to socioeconomic cofounders.

Critical appraisal

The three primary studies were appraised using the Critical Appraisal Skills Programme (CASP) checklist for cohort studies (Critical Appraisal Skills Programme, 2018). The cohort study is the gold standard when answering an incidence and prevalence question due to its

level on the hierarchy of evidence and so all studies appraised in this review were cohort studies or cross-sectional studies (Rutjes AW, 2005).

All three studies had clearly defined titles and aims, outlining the populations being studied (Critical Appraisal Skills Programme, 2018). Biggs et al. focused solely on women who were denied an abortion compared with women who received one, whereas Yan Liu et al. and Rajkumar et al. focused their study instead on the total population of women of childbearing age in specific states and countries (Biggs MA, 2017), (Rajkumar RP, 2022), (Liu SY, 2023). This may have led to many confounding variables in the Rajkumar et al. and Yan Liu et al. studies, which is actually something they both appreciated in their conclusions. The outcomes measured in each study all generally focused on common psychological conditions, however Biggs et al. included six total measures of mental health to decrease reporting and recording biases: two measures for both anxiety and depression via the Brief Symptom Inventory depression and anxiety subscales, one measure for self-esteem via the global self-esteem scale, and one measure for life satisfaction via the Satisfaction With Life Scale. The others reported just a single outcome of either prevalence of disorders (Rajkumar et al.) or frequency (Yan Liu et al.). All three outcomes have a degree of subjective measure which is to be expected when analysing the highly subjective psychological impacts of a variable however, all were well described and appropriate for the question (Judge-Golden C, 2022).

The selection processes of all three studies are outlined with detail. Biggs et al. provided reasonable exclusion criteria such as language spoken, age, and the incidence of foetal abnormalities or specific health indications for abortion, and baseline characteristics statistics were provided and appear well balanced (Biggs MA, 2017). They also included mixed effects regression analyses to account for cofounders. Rajkumar et al. included all people recorded by the Guttmacher Institute on global abortion policy as well as those recorded from the Global Burden of Disease Studies (Rajkumar RP, 2022). Their only exclusion criteria were countries where mental health data were not available which appears reasonable. They also further tried to minimise skewed results from important cofounders by correcting both their cross sectional and longitudinal analyses. Yan Liu et al. accounted for cofounding variables in their selection processes from the Behavioural Risk Factor Surveillance System by applying z-transformation to factors at state level in response to the skewed results (Liu SY, 2023). They also ensured their included data was from biological females, and all participants had complete information on outcome. They stated that participants with missing data were more likely to have less education and lower household incomes, perhaps suggesting a possible cofounder of socioeconomic status. Overall, though, all three selection processes appear reasonable and aim to reduce selection bias and cofounding as possible.

In the Biggs et al. study, 558 out of the 956 initial participants were recorded by the last interview (Biggs MA, 2017). Despite the authors stating that there were no differences in the loss to follow up group compared to staying participants in terms of anxiety or depression, the 58.4% retained is quite low and it is therefore unclear whether these women who were lost to follow up would have different outcomes as a reason is not given. Given the nature of the other two studies, there was no loss to follow up due to the data being collected from information and surveys already available. The outcomes in the Biggs et al. study was recorded semi-annually for five years compared to the Rajkumar et al. study which collected data throughout a ten-year period between 2009 and 2019. It is unclear

whether this is significant due to the highly variable course of psychological conditions such as depression, but a longer follow up time may yield more accurate results (Mayo Clinic, 2022). The Yan Liu et al. study took a snapshot of data in 2018 and therefore could have included a larger range of women to prove the reproducibility of their results (Liu SY, 2023).

4. Discussion

The findings in all three primary studies to some degree show that restrictive abortion laws can lead to detrimental impacts on the mental health of women across the world. Though, it is unclear how much this data is due to confounding factors and therefore more research is needed on this topic especially due to the current climate. Across the studies included in this review, the main covariates are ethnicity, age, educational level, marital and family status, employment, drug usage, and history of violence, abuse or mental health diagnoses (Biggs MA, 2017), (Rajkumar RP, 2022), (Liu SY, 2023). Furthermore, access to abortion differs across regions despite the legislation, making it more difficult to analyse the data collected at a state-level (Psych, R, 1972). This could be due to the disparities amongst gynaecologists and the influence of more dominant characters in society swaying other's opinions. Even if these results are mildly skewed by some of these factors, the real-world implications of restricted women's rights are still undeniable.

There is little evidence out there to support the damaging impact that abortion restrictions may have on the population, despite there being many papers justifying the recent ban decided by the Supreme Court. Just for one example, there are articles written trying to prove that abortion can harm an intimate relationship (Chae S, 2017). However, a recent study has shown that carrying an unwanted pregnancy to term does not increase the chances of keeping a relationship with the father of the child (Upadhyay, UD, 2022). Another example would be the laws that require women seeking an abortion to sit through warning of the possible negative psychological consequences of the procedure which can be seen as biased. Biggs et al. suggests that a better approach would be to instead solely provide these women with accurate, scientific information before they make their decision (Biggs, M.A., 2017). Moreover, a different study found that the women in their sample were not depressed in the long term by the event of an abortion (Nathe, William M, 1972). Some possible suggestions for this were made. For one, receiving permission to seek an abortion relieves guilt, contrary to the circumstances where society shuns women for this choice, making them believe in themselves that they've done something wrong. Depression and anxiety can stem from these beliefs and manifest into long term disorders fuelled by society's criticism. Furthermore, another related reason suggested was that when the woman sees the liberalised laws passed for abortion, she sees it as a reflection of society as a whole beginning to become more accepting of her choices. A common theme keeps propping up in the current related literature and studies, and, as stated in the introduction, the conclusions drawn are very often biased by out-dated ideological beliefs that can hinder very real people who are subject to the laws passed because of it (Rajkumar RP, 2022). Therefore, when considering the neuropsychiatric consequences of changing abortion laws, it is imperative to think beyond impacts on women seeking and receiving abortions, and to explore the possible societal effects on the broader group of women of childbearing age, and by extension, women in society as a whole (Beltz MA, 2015).

5. Conclusion

The question cannot be answered confidently through review of the current literature due to any associations found linked to existing cofounders. However indirect though, the results from all three studies included suggest a modest relationship between abortion access and mental health related presentations.

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