

# Correlates of Common Mental Disorders Among Dutch Women Who Have Had an Abortion: A Longitudinal Cohort Study

**CONTEXT:** Credible research has not found any evidence that abortion causes mental disorders. It is not known, however, whether abortion-specific risk indicators and other variables are associated with the incidence or recurrence of mental disorders after abortion.

**METHODS:** As part of a prospective cohort study conducted in the Netherlands, 325 women were interviewed between April 2010 and January 2011, between 20 and 40 days after having an abortion; 264 were followed up an average of 2.7 years later. Associations between selected baseline variables and postabortion incident or recurrent mental disorders among the 199 women at risk were investigated using bivariate and multivariate logistic regression analyses.

**RESULTS:** Thirty-two percent of women at risk of an incident or recurrent mental disorder experienced one after the abortion. In multivariate analyses, no abortion-related variables (e.g., history of multiple abortions, second-trimester abortion, preabortion decision difficulty or uncertainty, and postabortion negative emotions) were associated with experience of any postabortion incident or recurrent mental disorders. The outcome was positively associated with having conceived within an unstable relationship (odds ratio, 3.0), number of negative life events in the past year (1.4) and having a history of mental disorders (2.4).

**CONCLUSIONS:** Correlates of postabortion mental disorders were variables that have been identified as general risk factors for mental disorders, which supports the idea that abortion does not pose specific risks to future mental health. Future research should investigate in what way unstable relationships, adverse life events and psychiatric history affect postabortion mental health.

*Perspectives on Sexual and Reproductive Health, 2017, 49(2):123–131, doi:10.1363/psrh.12028*

Several literature reviews on abortion and mental health have concluded that there is no evidence that abortion causes mental disorders.<sup>1–3</sup> Although some studies have found a positive association between abortion and women's lifetime history of mental disorders,<sup>4</sup> these disorders mostly predate the pregnancy.<sup>5,6</sup> At the same time, the research suggests that a history of mental disorders is more common among women who have had an abortion than among women who have not or who have given birth.<sup>7,8</sup> These findings suggest that women who have had an abortion—or at least some categories among them—could be particularly vulnerable to future mental disorders. Risk indicators such as adverse life events and lack of social support are known to affect women's mental health in general;<sup>9,10</sup> however, it is not known whether the same variables are relevant to the mental health of women who have had an abortion, and whether abortion-related variables such as low decision certainty, high negative emotions postabortion and having a second-trimester abortion are associated with postabortion mental health.

Few studies have investigated correlates of the incidence or recurrence of mental disorders after an abortion. Incidence and recurrence are more useful outcome measures than prevalence in regard to understanding the etiology of disorders<sup>11</sup> and their correlates. One study looked at

the incidence of psychiatric contact after an abortion and found that it was the same as the preabortion incidence;<sup>12</sup> however, not all people with mental disorders will seek treatment, which might introduce selection bias. Therefore, existing research should be complemented with new studies using strong structured diagnostic instruments to assess incidence and recurrence of a wide variety of mental disorders. The Dutch Abortion and Mental Health Study is an attempt to fill this gap.

In previous work based on that study, using pairs of Dutch women matched by confounding covariates,<sup>13</sup> we found no difference between those who had had an abortion and those who had not in the incidence of mental disorders, but did find a potentially (marginally significant) elevated recurrence of mental disorders in the abortion group. In the current study, we explicitly focus on correlates among women who have had an abortion, and not on the relative contribution of the abortion to future mental health. We are thus able to investigate whether variables that might be associated with mental disorders in the general population also might be associated with incident or recurrent mental disorders in this particular group. This would not be possible in a study comparing women who had abortions with women who had no history of abortion.

By Jenneke van Ditzhuijzen, Margreet ten Have, Ron de Graaf, Carolus H.C.J. van Nijnatten and Wilma A.M. Vollebergh

Jenneke van Ditzhuijzen is research scientist and lecturer; Carolus H.C.J. van Nijnatten is professor; and Wilma A.M. Vollebergh is professor—all with the Department of Interdisciplinary Social Sciences, Utrecht University, the Netherlands. Margreet ten Have is senior scientist, and Ron de Graaf is senior scientist—both with the Netherlands Institute of Mental Health and Addiction (Trimbos Institute), Utrecht.

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Several authors have hypothesized that variables related to abortion or unwanted pregnancy could be related to subsequent mental disorders. For example, women who have had a second-trimester abortion might be more likely than those who have had a first-trimester abortion to experience subsequent mental health problems;<sup>14</sup> however, this finding could not be replicated in another study.<sup>15</sup> In addition, women who have had multiple abortions could have a greater risk of mental disorders than women who have had one,<sup>1,16</sup> although others found no association in adjusted analyses.<sup>6</sup> Furthermore, several abortion-related variables—difficulty deciding to have an abortion, low self-efficacy for coping with an abortion, postabortion avoidance coping, the emotional burden of having an unwanted pregnancy and abortion, and negative emotions after an abortion—have been found to be associated with psychiatric history<sup>17</sup> and might affect long-term mental health. Indeed, difficulty deciding to have an abortion has been linked to higher depression scores six months after an abortion<sup>18</sup> and to increased negative emotions two years after.<sup>19</sup> Moreover, low self-efficacy for coping with an abortion and high avoidance-oriented coping have been found to be positively associated with symptoms of depression among women who have had an abortion,<sup>20–22</sup> and postabortion negative emotions with mental disorders in general.<sup>23</sup>

Social support and recent negative life events are closely related to abortion-related variables and should be taken into account in research on the subject. Social support might function as an “emotional buffer” for women who have experienced an adverse life event such as an unwanted pregnancy or abortion, protecting them against the incidence of mental disorders.<sup>24</sup> Empirical research has confirmed that perceived social support is an important correlate of women’s postabortion experiences,<sup>7,25</sup> and that the relationship between social support and symptoms of depression might be mediated by self-efficacy and coping.<sup>21,26</sup> Past-year negative life events have been associated with negative mental health in the general population<sup>9</sup> and with postabortion anxiety (but not depression),<sup>18</sup> and such events could also be linked with the abortion decision itself.<sup>27</sup>

For a number of reasons, it is also important to account for background variables when investigating correlates of postabortion mental health. First, sociodemographic variables have been associated with negative mental health outcomes in the general population.<sup>28</sup> Poverty, lower levels of education and other social inequalities have been associated with poorer mental health outcomes;<sup>29,30</sup> they have also been linked to unwanted pregnancy and abortion, although findings have been mixed.<sup>3</sup> Second, childhood abuse has been consistently associated with mental disorders<sup>31</sup> and with abortion itself.<sup>32,33</sup> Third, a history of mental disorders has repeatedly been found to be the most important predictor of mental disorders among women who have had an abortion.<sup>1–3</sup>

In the current study, we set out to identify correlates of the incidence or recurrence of common mental disorders among Dutch women 2.5–3 years after an abortion.

## METHODS

### Study Design

This study was based on the first two waves (April 2010–January 2011 and December 2012–November 2013) of the three-wave prospective Dutch Abortion and Mental Health Study. Women were recruited by clinical staff in abortion clinics; in the Netherlands, 91% of abortions in 2014–2015 were performed in these specialized clinics.<sup>34</sup> Seven of the 16 existing clinics participated in the study; an additional clinic was asked, but could not participate because it was in the process of reorganizing. Clinics were selected on the basis of geographic location and clinic size with the aim of ensuring a nationally representative sample of respondents.

Clinic staff members asked women shortly after the abortion to read the research flyer, complete a reply card and deposit the card in a locked mailbox. The card included a consent-to-contact form on one side and a nonresponse form on the other. After approximately two weeks, interviewers contacted consenting women by telephone or e-mail to check eligibility and schedule an interview. Women were eligible to participate if they were over the age of 18, spoke Dutch and had obtained a medical or aspiration termination of an unwanted pregnancy of a maximum of 22 weeks’ gestation without clear fetal or maternal medical indications. Baseline interviews occurred 20–40 days after the abortion; follow-up was, on average, 2.7 years later.

Trained female professional interviewers conducted face-to-face interviews in participants’ homes or in other locations of their choice (e.g., a university office or a quiet hotel lobby). On average, interviews took around 2.5 hours at baseline and 1.5 hours at follow-up. At both waves, participants received a 50-euro gift card. The study was approved by a medical ethics review board of the Central Committee on Research Involving Human Subjects.

### Participants

Overall, 1,077 women consented to be contacted, and 1,366 declined; baseline participant flow and nonresponse analysis results are described extensively elsewhere.<sup>7</sup> In all, 919 women were contacted; 10 of these were not eligible. Of the remaining women, 381 were not reachable, 120 could not make an appointment within the interview time window, 38 did not show up for their interview, 38 refused on reconsideration and 10 were excluded after a second eligibility check. In total, 332 women were interviewed, although seven did not complete their interview; thus, the final baseline sample comprised 325 women.

At follow-up, 264 participants—or 81%—were reinterviewed. Thirty-two women could not be traced, 21 declined to be reinterviewed, and eight canceled or did not show up for their scheduled follow-up. Attrition analysis revealed that women aged 18–24 and 25–34 were more likely than those aged 35–46 to discontinue participation (odds ratios, 8.4 and 4.6, respectively), and religious women were more likely than nonreligious women to discontinue (2.5). Attrition was not associated with the categories of mental disorders studied.

## Measures

•**Postabortion mental disorders.** We assessed the presence of disorders categorized in the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (*DSM-IV*), using the previously validated Composite International Diagnostic Interview (CIDI), version 3.0;<sup>35,36</sup> the instrument was subsequently adapted to obtain a conceptually and cross-culturally comparable version in Dutch.<sup>37</sup> The following common mental disorders were included: mood disorders (major depression, dysthymia and bipolar disorder), anxiety disorders (panic disorder, agoraphobia, social phobia, specific phobia and generalized anxiety disorder) and substance use disorders (alcohol and drug abuse or dependence). In addition, we included an aggregate measure reflecting the presence of any of the measured disorders. At baseline, we assessed lifetime history of mental disorders; at follow-up, the time frame was the period since baseline. The lifetime prevalence of mental disorders in the general population, as measured with the CIDI 3.0, was 43% for the Netherlands in 2007–2009<sup>37</sup> and 47% for the United States in 2002–2003.<sup>36</sup>

Our outcome measure was incidence or recurrence of any common mental disorder in the period between baseline and follow-up. The population at risk consisted of the 199 respondents who had never had a mental disorder or had had a mental disorder but not in the month prior to baseline. We added previous mental disorders (i.e., being at risk for recurrence) as a predictor variable in the model. Additional analyses were performed for mood, anxiety and substance use disorders.

•**Abortion-related.** We included a measure of whether, at baseline, women reported having had any previous abortions. In addition, gestational age was measured as the number of weeks from the first day of the last menstrual period to the termination of the recent pregnancy; from this, we determined whether women had a second-trimester abortion (i.e., at a gestational age of 13 weeks or more).

Women were asked about their preabortion decision difficulty (“To what extent did you have difficulty with making the decision to have an abortion?”), emotional burden of the abortion (“Looking back at the abortion, to what extent did you find the abortion procedure itself—not the unwanted pregnancy—emotionally burdensome?”) and emotional burden of the unwanted pregnancy (“And to what extent did you find the unwanted pregnancy emotionally burdensome?”). Responses were on a scale of 1–5 (“not at all” to “very large extent”). Postabortion decision uncertainty (“To what extent are you sure this was the right decision?”) was measured on a scale of 1–5 (“not at all” to “completely”) and reverse-scored. Because women who experience difficulties were of particular concern, we dichotomized these four items and categorized them as low (scores of 1–3) or high (4 and 5).

At baseline, women were asked to report their level of agreement with statements about feeling six emotions postabortion: relief, guilt, emptiness, closure, mourning or loss, and pride. Responses were on a scale of 1–5

(“disagree a lot” to “agree a lot”). We constructed a positive emotion scale consisting of relief, closure and pride (Cronbach’s alpha, 0.64), but we ultimately removed pride, which increased the reliability (0.72). We also constructed a negative emotion scale consisting of guilt, emptiness, and mourning or loss (0.80).

A four-item scale of postabortion self-efficacy (Cronbach’s alpha, 0.78) measured the extent to which women believed at baseline they could handle situations that might remind them of the abortion; the scale was adapted from one developed by Major et al.<sup>38</sup> Women rated items (e.g., “To what extent were you able to spend time around children or babies comfortably?”) on a scale of 1–5 (“not at all” to “very well”). In addition, we included two scales measuring postabortion coping style: one for emotion-oriented coping (0.79) and one for avoidance-oriented coping (0.76). The scales were adapted from the shortened Dutch version of the Coping Inventory for Stressful Situations.<sup>39</sup> Each included seven items that asked women to indicate on a scale of 1–5 (“not at all” to “a great deal”) the extent to which they reacted after the abortion; an example of an emotion-oriented coping item is “blame myself for having gotten into this situation,” whereas an example of an avoidance-oriented coping item is “take some time off and get away from the situation.”

•**Social support.** Women were asked “To what extent did you experience pressure from others (e.g., partner, family) to have an abortion?” Responses were on a scale of 1–5 (“not at all” to “very large extent”); because the level of abortion pressure reported was generally low, we dichotomized the item and categorized support as low (scores of 1 and 2) or high (3–5).

In addition, women reported whether they were currently in a stable relationship or had been in one when the unwanted pregnancy occurred. Those who responded yes were asked whether this stable partner was also the individual with whom they had become pregnant, whereas those who responded no were asked what type of relationship they had been in (response options were “extramarital relationship or casual sexual affair,” “unstable relationship” and “don’t know”). We then compared women reporting that the man involved in the pregnancy was a stable partner with those in all other categories combined.

Women were asked with how many of six types of people (i.e., partner, mother, father, friend, another family member or some other person) they had discussed the intended abortion while making the decision. We measured social support using the abortion-specific perceived social support and social conflict scale that Major et al. adapted from the Social Provisions Scale.<sup>25</sup> Women rated the extent to which select individuals with whom they had discussed the abortion—the partner with whom they had become pregnant, their mother, their father and a friend—had performed seven supportive behaviors before the abortion (e.g., “let you know he/she would be there for you no matter what you decided to do”). Responses were on a scale of 1–5 (“did not do this at all” to “did this a great deal”) and were averaged to yield social support scores for the partner

(Cronbach's alpha, 0.88) and for all other confidants together (0.90). In total, 227 women had discussed the abortion with a partner, and 202 with another confidant; to prevent losing cases in the regression analyses, we created dummy variables based on three categories of social support ("high," indicated by a mean score of 3.5 or greater; "low," mean score of less than 3.5; and "did not tell").

•**Recent negative life events.** We used an adapted version of the Brugha Life Events Section<sup>40</sup> to assess women's experience of the following negative life events in the 12 months prior to baseline: serious illness or injury; serious illness or injury of a close relative or partner; death of a brother, sister, child or partner; death of another close relative or close friend; separation or divorce; friendship break; serious problem with a good friend, relative or neighbor; loss of employment; and serious financial problems. The abortion was not included as a possible negative life event. In addition, women were able to provide an open-ended response about other life events. We calculated a count variable for number of negative life events with a range of 0–10.

•**Background variables.** Sociodemographic variables were assessed at baseline. Age was measured continuously. Women reported their total monthly net income (including their partner's income, if they lived with him); we created a dichotomous variable of low household income (below 1,500 euros or not). Education level was measured in eight categories, and then categorized as lower education (primary or lower secondary) or higher (higher secondary or above). We also included dichotomous measures of whether the respondent had living children, was unemployed, considered herself religious and was of non-Western ethnicity. Following the standard definition of Statistics Netherlands,<sup>41</sup> we categorized a respondent as being of non-Western ethnicity if she reported that she or at least one parent was born in Turkey, the Caribbean, Africa, Asia (excluding Japan and Indonesia) or Latin America.\*

In addition, childhood abuse assessed four types of abuse—physical, emotional, psychological and sexual—before age 16 and was measured in the same way as in a Dutch population study of mental health.<sup>42</sup> Women were considered to have been physically abused if they reported experiencing two or more incidents; emotional neglect and psychological abuse were combined into one measure and scored in the same way (i.e., two or more incidents). Women were considered to have been sexually abused if they reported experiencing one incident.

Finally, we included measures of previous mental disorders. Women were considered at risk for a recurrent disorder

if they had ever had a disorder at baseline, and were considered at risk for an incident disorder if they had never had a disorder at baseline; in additional analyses of types of mental disorders, women were at risk if they had never had the specific type of disorder. Only one participant with a history of mental disorders developed the disorder in the year before the abortion; this case was excluded from our analyses.

## Analysis

We performed descriptive analyses of all potential predictors. Then, because information on potential correlates of the prevalence of mental disorders is inconsistent,<sup>3</sup> and

**TABLE 1. Selected baseline characteristics of Dutch women having abortions, Dutch Abortion and Mental Health Survey, 2010–2011**

Characteristic	% or mean (N=325)
<b>Sociodemographic</b>	
Mean age (range, 18–46)	29.81 (7.66)
Has living children	54
Low household income	47
Unemployed	29
Lower education level	21
Non-Western ethnicity	21
Religious	25
<b>Childhood abuse</b>	
Physical	23
Psychological/emotional	43
Sexual	19
<b>History of mental disorders</b>	
Any	68
Mood	41
Anxiety	40
Substance use	23
<b>Recent negative life events</b>	
Mean no. in last year (range, 0–10)	1.64 (1.49)
<b>Abortion-related</b>	
Multiple abortions	27
Second-trimester abortion	7
High preabortion decision difficulty	32
High preabortion decision uncertainty	10
High emotional burden of the unwanted pregnancy	65
High emotional burden of the abortion	36
Mean postabortion positive emotions (range, 2–10)	7.43 (2.18)
Mean postabortion negative emotions (range, 3–15)	8.53 (3.42)
Mean postabortion self-efficacy (range, 1–5)	3.38 (1.00)
Mean postabortion emotion-oriented coping (range, 7–35)	15.94 (6.41)
Mean postabortion avoidance-oriented coping (range, 7–35)	18.58 (6.95)
<b>Social support</b>	
Experienced pressure to have abortion	15
Unstable relationship	19
Mean no. of confidants (range, 0–6)	2.61 (1.40)
Support from partner	
High	66
Low	19
Did not tell	15
Support from others	
High	66
Low	8
Did not tell	26

Notes: Unless otherwise noted, data are percentages. Figures in parentheses are standard deviations. Low household income was defined as a total monthly net income (including partner's income, if living with a partner) of below 1,500 euros. Lower education was defined as primary or lower secondary.

\*This categorization is the most general definition used in the Netherlands. Those with a Japanese or Indonesian background are classified as Western on the basis of their social and economic position in Dutch society: People in the Netherlands of Indonesian background mainly had origins in the former Dutch East Indies, and people of Japanese background are mostly employees of Japanese companies and their families (source: Alders M, Classification of the population with a foreign background in the Netherlands, paper presented at the conference The Measure and Mismeasure of Populations: The Statistical Use of Ethnic and Racial Categories in Multicultural Societies, Paris, Dec. 17–18, 2001).

**TABLE 2. Number of women at risk of incident or recurrent mental disorders following abortion, and percentage experiencing disorders, by type of disorder**

Type of disorder	Incident or recurrent		Incident		Recurrent	
	No. at risk	% with disorder	No. at risk	% with disorder	No. at risk	% with disorder
<b>Any</b>	<b>199</b>	<b>32</b>	<b>88</b>	<b>21</b>	<b>111</b>	<b>41</b>
Mood	250	19	159	12	91	31
Anxiety	217	18	153	15	64	27
Substance use	255	9	204	5	51	28

Notes: Women were considered at risk of incident disorders if they had not had a disorder (or specific type of disorder) in the month before baseline; they were considered at risk of recurrent disorders if they had had a disorder (or specific type of disorder) more than one month before baseline.

information on incident or recurrent mental disorders is virtually nonexistent,<sup>13</sup> we conducted bivariate logistic regression analyses to explore variables associated with incident or recurrent mental disorders. All variables found to be significant at  $p < .10$  were entered into multivariate logistic analyses; multicollinearity was not violated (tolerance of greater than 0.1; variance inflation factor of less than 10).

Multivariate analyses, including interactions between psychiatric history and each significant variable, were conducted to determine if the findings were different for women with incident and recurrent mental disorders. Analyses of interactions with psychiatric history did not yield any significant results; therefore, we did not analyze incident and recurrent disorders separately. We looked at the incidence or recurrence of any mental disorder, and then separately at incidence or recurrence of mood, anxiety and substance use disorders. Testing was two-sided, and statistical significance was considered to be  $p < .05$ . Analyses were performed with SPSS version 22.

## RESULTS

### Sample Characteristics

At baseline, the mean age of women in the sample was 30 (Table 1). Some 54% of women had children, 47% had a low household income and 29% were unemployed. One-fifth had a lower level of education and a non-Western ethnic background; one-quarter reported being religious. Childhood physical abuse was reported by 23% of women, psychological or emotional abuse by 43% and sexual abuse by 19%. Sixty-eight percent of women had a history of mental disorders, and on average, women had experienced 1.6 negative life events in the prior year.

Twenty-seven percent of women had had multiple abortions, and 7% had terminated a second-trimester pregnancy. Although 32% of women had experienced difficulty deciding to have the recent abortion, only 10% had felt uncertain about the decision. Nineteen percent of women reported that their recent pregnancy had occurred within an unstable relationship; 66% had felt a high level of support from the partner with whom they became pregnant.

Compared with women from a general population cohort who were in the same age range and had not had an abortion,<sup>7</sup> women in our sample were younger;

were more likely to be living without a partner, unemployed, of non-Western ethnicity and nonreligious; and were more likely to have been abused in childhood (not shown). In addition, a greater proportion of women in our sample than of those in the larger cohort reported a previous mental disorder (68% vs. 42%). A nonresponse analysis showed that women in our sample were significantly older and less likely to be of non-Western ethnicity than women in the nonresponse group. Compared with the total population of Dutch women treated in two abortion clinics during the recruitment period,<sup>7</sup> women in our sample were more likely to be cohabiting and more highly educated, and less likely to have had multiple abortions.

### Incidence or Recurrence of Any Mental Disorder

Among the 199 women who were at risk of experiencing any incident or recurrent postabortion mental disorder, 32% developed one between baseline and follow-up (Table 2). Twenty-one percent of the 88 women who had not had a mental disorder at baseline experienced an incident disorder, and 41% of the 111 women who had had a mental disorder at baseline (but not in the prior month) experienced a recurrent disorder.

In bivariate analyses, at least some variables in each category were associated with postabortion incident or recurrent mental disorders (Table 3). Of the abortion-related variables, only high emotional burden of the abortion, postabortion self-efficacy and postabortion avoidance-oriented coping were associated with the outcome. Other variables related to incidence or recurrence of mental disorders were age, low household income, all childhood abuse measures, history of mental disorders, number of recent negative life events, pregnancy within an unstable relationship, and low support from a partner and from others.

In the multivariate analysis, no abortion-related variable was associated with postabortion incident or recurrent mental disorders. Women who had had a previous mental disorder had greater odds than others of experiencing a mental disorder postabortion (odds ratio, 2.4). In addition, number of negative life events in the last year and becoming pregnant within an unstable relationship were positively associated with postabortion mental disorders (1.4 and 3.0, respectively).

**TABLE 3. Selected characteristics of women at risk for incident or recurrent mental disorders following abortion, and odds ratios (and 95% confidence intervals) from bivariate and multivariate logistic regression analyses examining the association between those characteristics and the outcome**

Characteristic	% or mean (n=199)	Bivariate	Multivariate
<b>Sociodemographic</b>			
Age	31.39 (7.72)	0.97 (0.93–1.01)†	0.96 (0.91–1.02)
Has living children	58	0.80 (0.44–1.45)	na
Low household income	40	1.89 (1.03–3.47)*	1.22 (0.53–2.84)
Unemployed	26	1.20 (0.61–2.35)	na
Lower education level	18	1.57 (0.74–3.33)	na
Non-Western ethnicity	18	1.57 (0.74–3.33)	na
Religious	21	0.83 (0.39–1.76)	na
<b>Childhood abuse</b>			
Physical	22	2.17 (1.09–4.33)*	2.33 (0.92–5.89)†
Psychological/emotional	40	1.78 (0.97–3.26)†	0.93 (0.41–2.10)
Sexual	17	2.05 (0.96–4.39)†	1.23 (0.49–3.08)
<b>History of mental disorders</b>			
	56	2.65 (1.40–5.04)**	2.44 (1.16–5.15)*
<b>No. of recent negative life events</b>			
	1.59 (1.45)	1.48 (1.20–1.84)***	1.40 (1.10–1.77)**
<b>Abortion-related</b>			
Multiple abortions	24	1.02 (0.50–2.05)	na
Second-trimester abortion	6	2.28 (0.71–7.38)	na
High preabortion decision difficulty	26	1.40 (0.72–2.74)	na
High preabortion decision uncertainty	7	0.57 (0.15–2.11)	na
High emotional burden of the unwanted pregnancy	63	1.04 (0.56–1.94)	na
High emotional burden of the abortion	32	2.22 (1.19–4.16)*	1.46 (0.68–3.15)
Postabortion positive emotions	7.51 (2.19)	1.09 (0.95–1.26)	na
Postabortion negative emotions	8.04 (3.39)	1.06 (0.97–1.16)	na
Postabortion self-efficacy	3.53 (0.99)	0.75 (0.55–1.02)†	0.99 (0.67–1.47)
Postabortion emotion-oriented coping	15.02 (5.97)	1.04 (0.99–1.09)	na
Postabortion avoidance-oriented coping	18.32 (6.99)	1.04 (1.00–1.09)†	1.04 (0.99–1.10)
<b>Social support</b>			
Experienced pressure to have abortion	12	2.00 (0.84–4.76)	na
Unstable relationship	16	2.75 (1.26–6.00)*	2.95 (1.04–8.34)*
No. of confidants	2.65 (1.38)	0.93 (0.75–1.16)	na
Support from partner			
High (ref)	68	1.00	1.00
Low	19	2.86 (1.36–6.01)**	2.07 (0.82–5.19)
Did not tell	13	1.51 (0.62–3.70)	0.89 (0.29–2.75)
Support from others			
High (ref)	65	1.00	1.00
Low	9	2.40 (0.88–6.50)†	3.28 (0.98–10.90)†
Did not tell	26	1.06 (0.53–2.14)	1.72 (0.65–4.58)

\*p<.05. \*\*p<.01. \*\*\*p<.001. †p<.10. Notes: ref=reference group. na=not applicable, because the variable was not included in the analysis. All characteristics were measured at baseline. Figures in parentheses following means are standard deviations. Low household income was defined as a total monthly net income (including partner's income, if living with a partner) of below 1,500 euros. Lower education was defined as primary or lower secondary.

### Incidence or Recurrence of Specific Disorder Types

As in the overall analysis, no abortion-related variable was significant in our multivariate analyses of the separate disorder categories—i.e., mood, anxiety and substance use (Appendix Tables 1–3, Supporting Information). Of the background variables, history of physical childhood abuse was positively associated with anxiety disorders following abortion (odds ratio, 4.0). Women with a history of mood disorders had greater odds than those without of experiencing a postabortion mood or anxiety disorder (2.8 and 4.9, respectively); women with a history of substance use disorders had elevated odds of experiencing all three categories of disorders (2.4–5.5). In addition, number of negative life events was positively associated with anxiety disorders and substance use disorders postabortion (1.4–1.5). Finally, women who had received a low level of sup-

port from their partner had elevated odds of experiencing a mood disorder postabortion (2.6), whereas women who reported becoming pregnant within an unstable relationship were more likely than others to experience an anxiety disorder (4.1).

### DISCUSSION

In this study, we identified variables associated with the postabortion incidence or recurrence of common mental disorders among a sample of Dutch women. Perhaps our most remarkable finding is that none of the abortion-related variables studied were related to the outcome. This is an important result, given earlier findings that decision difficulty, negative emotions postabortion, and other pre-abortion and postabortion variables have been strongly associated with psychiatric history before the abortion.<sup>17</sup>

Contrary to earlier findings,<sup>23</sup> negative emotional reactions after an abortion were not associated with postabortion mental disorders in our sample. Thus, even though psychiatric history may be related to how unwanted pregnancy and abortion are experienced, our findings suggest that abortion-related experiences are not associated with postabortion mental disorders once other mental disorder risk indicators are taken into account.

Among the other variables studied, becoming pregnant within an unstable relationship was strongly associated with postabortion mental disorders. Relationship problems are frequently mentioned as a reason for abortion.<sup>43</sup> Good relationships can form a strong foundation for positive mental health, and both happily married and single people fare better in terms of mental health than people who are unhappily married.<sup>44</sup> In our multivariate analysis of any incident or recurrent mental disorder, relationship stability was more strongly associated with the outcome than was social support from a partner. A possible explanation is that our partner support measure did not fully capture the quality of the support, because it was measured only when women had talked to their partner about the unwanted pregnancy. Another possibility is that the predictive power of low social support disappeared in the multivariate model because it was explained by other variables, such as avoidance coping. Other studies have found that associations between social support and postabortion mental health were mediated by self-efficacy and coping.<sup>21,26</sup> Future research should further investigate how the role of a partner and relationship quality contribute to postabortion mental health.

In addition, we found that women's number of recent negative life events was positively associated with postabortion mental disorders—a finding similar to those from research among the general population.<sup>9</sup> Previous research has shown that the experience of negative life events is highly prevalent among women who have unwanted pregnancies and abortions, and that they are often interrelated in what has been described as a “chain effect.”<sup>27</sup> These life events could contribute to women's becoming pregnant unintentionally or their deciding to terminate the pregnancy. Our findings support this theory by showing that the association exists even if variables related to the abortion itself are unrelated to postabortion mental health.

Overall, previous psychopathology was the variable most consistently associated with our different categories of postabortion mental disorders; this is in line with earlier findings.<sup>1,3,6</sup> A history of mental disorders could explain associations between abortion and mental health, in the sense that it may predispose women to future psychopathology, regardless of whether they terminate an unwanted pregnancy.<sup>6</sup> Furthermore, women who have had an abortion have three times the odds of those who have not had an abortion of having had previous mental disorders.<sup>7</sup> Therefore, research investigating the link between abortion and mental health should always consider previous psychopathology.

## Strengths and Limitations

Strengths of this study include the use of a reliable and valid instrument—the CIDI 3.0—to assess a wide variety of common mental disorders. Furthermore, we improved the possibility of establishing causal relationships by measuring postabortion incidence and recurrence rather than the prevalence of mental disorders—thereby excluding women with disorders at baseline—and by including risk indicators all measured at baseline. We also had accurate timing information about the abortion, because we used a cohort of women who had an abortion about four weeks before the baseline interview. In addition, the response rate at follow-up was high, and attrition was barely selective.

Nevertheless, a number of limitations warrant discussion. Although the total sample size was sufficient, our focus on incidence and recurrence, rather than prevalence, lowered the number of cases in the analyses; as a result, we could not investigate incidence and recurrence separately. Associations with unmeasured variables can never be ruled out in this type of research, even though our list of measures was fairly extensive. Also, the outcome estimates are based on self-reported lifetime disorders at baseline and disorders at follow-up nearly three years later. Prior studies have demonstrated that lifetime estimates of mental disorders are likely to be artificially low, because of difficulties with accurate recall.<sup>45,46</sup> Thus, the actual number of recurrent cases was likely higher than reported, and the number of incident cases was likely lower, which means that the association of our measure of previous mental disorders might be even stronger than reported here. Furthermore, we did not use a comparison group of women who did not have an abortion or an unwanted pregnancy; however, this was a deliberate choice, because our focus was correlates of mental health disorders when the abortion is already a given.

Lastly, this study was done in the Netherlands; therefore, the results might not be generalizable to other contexts. Abortion in the Netherlands is free, legal and available until 22 weeks of gestation. The Dutch abortion law is among the most liberal in the world, yet the country's abortion rate is among the lowest. Also, stigmatization of abortion seems to be less in the Netherlands than in some other countries.<sup>47,48</sup> Variables such as access to abortion and abortion stigma might be expected to confound associations to a larger extent in other contexts than in the Netherlands. Thus, the potential impact of abortion-related variables—as well as variables measuring social support and negative life events—might be different in countries where circumstances are more restrictive and women are faced with barriers to access and social stigma around abortion.

## Conclusion

We found that correlates of postabortion mental disorders were not abortion-specific; other studies have found that these correlates also predict negative reactions to other types of stressful life events, like childbirth.<sup>16</sup> This supports the idea that abortion does not pose specific risks on future mental health.<sup>2</sup> This implies that women who

have abortions, even those who experience more negative emotions and stress related to the abortion, do not need abortion-specific interventions aimed at prevention of mental disorders.

However, women with an unstable relationship with the partner with whom they became pregnant, a higher number of recent negative life events and a history of mental disorders are at increased risk for future mental disorders. Even though these risks are not abortion-specific, the abortion care setting may be a good place to be attentive to these experiences. If abortion clinicians notice that a woman appears to be having difficulty with her decision-making process or abortion experience, they might consider the possibility of underlying mental disorders, unrelated to the abortion.<sup>18</sup> Postabortion counseling may then be an opportune moment to provide further support, offer interventions or refer women to general mental health care. To explore this further, research should attempt to answer the question of why women with a history of mental disorders are at increased risk for unwanted pregnancy and abortion.

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#### Acknowledgments

The authors thank Diana Greene Foster, Corinne H. Rocca, M. Antonia Biggs and Lauren Ralph for their helpful comments on a draft of this article. This work was supported by the Dutch Ministry of Health, Welfare and Sport, via the Netherlands Organization for Health Research and Development (ZonMW, grant number 127000003). The funding source had no role in the study design; the collection, analysis or interpretation of data; the writing of this article; or the decision to submit for publication.

**Author contact:** [j.m.vanditzhuijzen@uu.nl](mailto:j.m.vanditzhuijzen@uu.nl)