

Original research article

The impact of psychiatric history on women's pre- and postabortion experiences

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Received 5 November 2014; revised 3 May 2015; accepted 9 May 2015

Abstract

Objective: The objective of this study is to investigate to what extent psychiatric history affects preabortion decision difficulty, experienced burden, and postabortion emotions and coping. Women with and without a history of mental disorders might respond differently to unwanted pregnancy and subsequent abortion.

Study design: Women who had an abortion ($n=325$) were classified as either with or without a history of mental disorders, using the Composite International Diagnostic Interview version 3.0. The two groups were compared on preabortion doubt, postabortion decision uncertainty, experienced pressure, experienced burden of unwanted pregnancy and abortion, and postabortion emotions, self-efficacy and coping. The study was conducted in the Netherlands. Data were collected using structured face-to-face interviews and analyzed with regression analyses.

Results: Compared to women without prior mental disorders, women with a psychiatric history were more likely to report higher levels of doubt [odds ratio (OR)=2.30; confidence interval (CI)=1.29–4.09], more burden of the pregnancy (OR=2.23; CI=1.34–3.70) and the abortion (OR=1.93; CI=1.12–3.34) and more negative postabortion emotions ($\beta=.16$; CI=.05–.28). They also scored lower on abortion-specific self-efficacy ($\beta=-.11$; CI=-.22 to .00) and higher on emotion-oriented ($\beta=.22$; .11–.33) and avoidance-oriented coping ($\beta=.12$; CI=.01–.24). The two groups did not differ significantly in terms of experienced pressure, decision uncertainty and positive postabortion emotions.

Conclusions: Psychiatric history strongly affects women's pre- and postabortion experiences. Women with a history of mental disorders experience a more stressful pre- and postabortion period in terms of preabortion doubt, burden of pregnancy and abortion, and postabortion emotions, self-efficacy and coping.

Implications: Negative abortion experiences may, at least partially, stem from prior or underlying mental health problems.

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Keywords: Abortion; Mental health; Doubt; Emotions; Coping; Self-efficacy

1. Introduction

Research consistently has shown that abortion experiences are highly variable, individualized and often characterized by both positive and negative feelings [1–3]. For some women, having an abortion is moderately stressful, and for others it is perceived as a severely stressful life event [4,5]. Stress-vulnerability models assert that pathogenic effects of stressors are more pronounced in more

vulnerable persons [6,7]; psychiatric history is considered a vulnerability factor of major importance. The objective of this study is to investigate to what extent psychiatric history affects how women experience the period around the abortion, in terms of preabortion decision difficulty, experienced burden of pregnancy and abortion, and postabortion emotions, self-efficacy and coping.

Research into preabortion psychiatric history is scarce and inconsistent. Studies assessing preabortion history of specific disorders, such as posttraumatic stress [8], depression [4,9,10] or anxiety [11], show variable prevalence rates of preabortion symptoms, and their conclusions are limited to specific disorders only. A few abortion studies have measured a wide range of disorders, using the Composite

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International Diagnostic Interview (CIDI) [12–16]. However, in most of these studies [12,13,15,16], abortion was based on retrospective self-report only, which is methodologically problematic, especially in the case of large time intervals between waves [17]. In our psychiatric epidemiology study [14], the date of abortion could be determined, and the abortion-to-interview interval was equally short for all participants. Results revealed that women who had an abortion were three times more likely to report a preabortion psychiatric history than women who did not have an abortion [14]. Preabortion psychiatric history should therefore be taken into account when investigating postabortion mental health.

It is relevant to find out whether women with and without preabortion mental disorders (MDs) respond differently to an event like unwanted pregnancy and subsequent abortion, as this might influence future mental health. For example, research has shown that women who experienced doubt during abortion decision making, or felt pressure to have the abortion, had poorer mental health outcomes postabortion [1,18,19]. Abortion experience variables might also mediate or moderate any possible effects of preabortion mental health on postabortion mental health. A study showed that abortion-specific self-efficacy partly mediated the relationship between pre- and postabortion depression [20]. Depression and anxiety may also be reciprocally related to avoidance coping [21]. Even though most reviews conclude that abortion itself does not predict MDs [17,19,22], women with a history of MDs might experience more stress around the abortion, which in turn might increase the likelihood or timing of recurrence of the disorder; in particular when prior mental health problems are associated with increased levels of stress. Therefore these variables should be taken into account when looking at links between mental health and abortion.

In the current study, we use the first wave of a cohort study (the Dutch Abortion and Mental Health Study; DAMHS) to compare women with and without a history of MDs. The main research question is: Do women with a history of MDs experience a more stressful period before and after an abortion than women without this history? The outcomes examined include preabortion doubt, decision uncertainty, experienced pressure, experienced burden (of pregnancy and abortion) and postabortion emotions, self-efficacy and coping. An exploratory sub-question is whether there are differences between types of disorder histories. Internalizing disorders, such as depression and anxiety disorders, have traditionally been related to abortion [9–11]. However, there are also indications that externalizing disorders, such as conduct disorder or alcohol abuse, might predispose for unwanted pregnancy [23,24]. We wanted to investigate whether these two types of disorder histories, as well as a comorbid internalizing and externalizing disorder history, are differentially related to various aspects of pre- and postabortion variables.

2. Material and methods

2.1. Participants and procedure

Participants were recruited by clinical staff in specialized abortion clinics. In the Netherlands, the majority of abortions are performed in these clinics. Eight out of the sixteen existing Dutch clinics were selected in order to attain a good balance on the basis of geographical location and clinic size, but one clinic could not participate due to reorganization at the time of the study. Shortly after the abortion procedure, staff members would ask the women to read the research flyer, complete a reply card and deposit it in a locked mailbox. Women wrote either their contact details on one side of this reply card in case they wished to be contacted for informed consent and the interview, or they completed a short nonresponse form on the other side in case they refused participation. The study enrolled Dutch-speaking women from 18 to 46 years, requesting an abortion (medical or aspiration, up to 24 weeks) for an unwanted pregnancy without clear fetal or maternal medical indications. In three clinics recruitment was limited to predetermined days when enough staff was available; in the other four clinics all eligible women were approached. We also collected demographic data and reasons for nonresponse from 1366 women who refused participation at recruitment, and another 158 women who were willing but did not participate, in order to do a response analysis.

Between April 2010 and January 2011, 10 professionally trained female interviewers interviewed the participants face-to-face 20 to 40 days after the abortion. The entire interview was laptop assisted and lasted on average 2.5 h. Oral and written informed consent was obtained at the time of the interview. The women received a gift card of €50 for their participation. The study was approved by a local medical ethics committee of the Central Committee on Research involving Human Subjects.

2.2. Psychiatric history

Presence of lifetime DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, fourth edition) disorders was assessed with the CIDI version 3.0, which was developed in the World Mental Health Survey Initiative [25] of the World Health Organization. The CIDI 3.0 can be administered by trained lay-interviewers. Using a fully structured and extensive questioning procedure, CIDI 3.0 assesses all diagnostic criteria and symptoms required to determine presence of a variety of common MDs. The CIDI 3.0 was first produced in English and underwent a rigorous process of adaptation in order to obtain a conceptually and cross-culturally comparable version in Dutch [26,27]. Clinical calibration studies in over 30 countries found that the CIDI 3.0 assesses various anxiety, mood and substance use disorders with generally good validity in comparison to blinded clinical reappraisal with Structured Clinical Interviews for DSM-IV [28]. Included internalizing disorders

were mood disorders (major depression, dysthymia, bipolar disorder) and anxiety disorders (panic disorder, agoraphobia, social phobia, specific phobia, generalized anxiety disorder). Externalizing disorders were childhood impulse control disorders (attention deficit hyperactivity disorder, conduct disorder, oppositional defiant disorder), substance use disorders (alcohol/drug abuse and dependence) and antisocial personality disorder. Childhood impulse control disorders were limited to respondents aged 18–44 because of concerns about recall bias in older respondents [29]. Based on lifetime occurrence of any MD, two groups were created: (a) women with a history of any MD and (b) women without this history (predictor variable). When a lifetime disorder had started shorter than a year before the interview, it was not included, in order to assure that disorders were not related to the current abortion.

2.3. Abortion decision difficulty

The items preabortion *doubt* (“To what extent did you have doubts regarding the abortion?”) and *experienced pressure* [“To what extent did you experience pressure of others (e.g., partner, family) to have an abortion?”] were measured with a 5-point scale (from *not at all* to *to very large extent*, middle category *moderate*). The reverse-scored item postabortion *decision uncertainty* (“To what extent do you stand by your abortion decision?”) was also measured with a 5-point scale (from *I don’t stand by it at all* to *I completely stand by it*, middle category *neutral*). Because women who experience difficulties were of particular concern, we dichotomized both doubt and decision uncertainty into low=0 (including the middle category) and high=1. For *experienced pressure* we included the middle category *moderate* in the high=1 group, because most women did not experience any pressure.

2.4. Experienced burden

The first item focused on the abortion treatment itself (“Looking back at the abortion, to what extent did you find the abortion treatment itself — not the unintended pregnancy — emotionally burdensome?”) and the second item on the unintended pregnancy (“And to what extent did you find the unintended pregnancy emotionally burdensome?”). Dichotomization of answer categories was the same as for *doubt*.

2.5. Postabortion emotions

The six emotions measured were feelings of relief, guilt, emptiness, closure, mourning/loss, and pride (“proud of myself that I could do it”). We presented these in the form of statements, for example, “After the abortion, I felt relieved”, with a 5-point scale ranging from *disagree a lot* to *agree a lot*. Because women can experience both positive and negative emotions after an abortion [3,5], we created two emotion scales. The *positive emotion scale* originally consisted of the items relief, closure and pride ($\alpha=.64$), but we removed the item “pride” which increased the reliability

($\alpha=.72$). The *negative emotion scale* ($\alpha=.80$) consisted of the emotions guilt, emptiness and mourning/loss.

2.6. Postabortion self-efficacy and coping

The four-item scale on *postabortion self-efficacy* was adopted from Major et al. [30]. Items were translated into Dutch and slightly adapted, since they were assessed after the abortion and not before. Women rated the extent to which they were able to “think about children or babies comfortably”, “spend time around children or babies comfortably”, “have physical intimacy” and “watch TV shows or read articles about abortion” ($\alpha=.78$). Responses were measured on a scale ranging from 1 (*not at all*) to 5 (*very well*). Postabortion coping was measured by two coping scales of the Dutch shortened version of the Coping Inventory for Stressful Situations, the CISS-21 [31,32]. Following others [30], we excluded the problem-oriented coping items scale because strategies such as “taking corrective action immediately” seemed not conceptually relevant after an abortion. We adapted the instruction so that it would measure postabortion coping specifically and not general coping style: “[...] Please indicate to which extent you reacted this way after you had the abortion.” Seven items measured *emotion-oriented coping style* ($\alpha=.79$), for example, “blame myself for having gotten into this situation”; and seven other items measured *avoidance-oriented coping style* ($\alpha=.76$) for example, “take some time off and get away from the situation.”

2.7. Covariates

We measured age, living situation (living together with a partner, living apart together, or no partner), relationship with progenitor (stable or unstable), having children (yes or no), western or nonwestern ethnicity [based on the definition of Statistics Netherlands: nonwestern=respondent or at least one parent of the respondent was born in Morocco, Turkey, Surinam, the Dutch Antilles, Africa, Asia (excl. Japan/Indonesia) or Latin-America; western=other], employment situation (paid job or not), household income (low versus medium or high), education level (primary/lower secondary, higher secondary or higher professional education), urbanicity of residence (urban versus rural), mean gestational age (range=2–21 weeks) and prior abortions (yes or no).

2.8. Statistical analysis

First, a response analysis was conducted, in which sociodemographics and abortion history of the interviewed DAMHS sample were compared to (a) women in the non-response group who could not or did not want to participate and (b) the full population of women treated in two abortion clinics during the recruitment period. Second, means and proportions of all outcome and covariate measures were calculated in order to describe the sample population. We also checked whether there were differences in prevalence rates between recruitment sites, using the chi-squared test. Third, we

selected covariates using a 10% criterion [33]: if adding the covariate to unadjusted regression analyses (predictor: psychiatric history) would change the regression coefficient by at least 10% for one or more of the outcome measures, it was selected as a covariate in our main regression analyses. Based on this, four covariates were selected for adjustment: age, living situation, children and household income. Fourth, logistic and linear regression analyses were performed for the outcome variables, adjusting for the selected covariates. The analyses were repeated for three mutually exclusive subgroups of MDs: internalizing disorders only, externalizing disorders only and comorbid internalizing and externalizing disorders. Testing was two sided and statistical significance was considered to be $p < 0.05$. Statistical analyses were performed using SPSS 22.

3. Results

Out of the 1077 women willing to be contacted, we attempted to contact a random selection of 919. Of these, 381 were not reachable, 120 could not make an appointment within the (rather narrow) time window for interviewing, 38 women did not show up at the interview, another 38 refused on reconsideration and 10 women were omitted after a second check on eligibility. Three hundred thirty-two women were interviewed. Seven interviews could not be completed, leaving 325 participants for analysis.

The response analysis showed that women in the interviewed sample were significantly older and less often of nonwestern origin than the women in the nonresponse group ($n = 1485$). Compared to the total population of Dutch women treated in two abortion clinics during the recruitment period, they were also more often living together, slightly higher educated and less often had had abortions before. Participant flow and response analysis results are described more extensively elsewhere [14].

Of the 325 respondents, 222 had had any lifetime MD. Of these, 106 reported internalizing disorders only, 30 reported externalizing disorders only and 86 both internalizing and externalizing disorders. In Table 1, descriptives of the outcome measures, sociodemographics and abortion-related variables are displayed for women with and without a history of MDs. Women with and without a psychiatric history did not differ in terms of gestational age ($F(1, 323) = .10$, $p = .76$), see Fig. 1. There were no differences in prevalence rates between the seven recruitment sites (chi-square (6) = 6.64; $p = .36$).

A significantly larger proportion reported severe preabortion doubts in the psychiatric history group (37.8%) than in the no-psychiatric-history group (20.4%). Results of logistic regression analyses are displayed in Table 2. After adjustment for confounding, the odds to have experienced doubt to large or very large extent were over two times greater for women with a psychiatric history than for women without this history [odds ratio (OR) = 2.30; confidence interval (CI) = 1.29–4.09; $p = .006$]. Exploratory analysis revealed that this finding was

strongest for women with a history of both internalizing and externalizing disorders (OR = 2.88; CI = 1.47–5.63; $p = .002$). There were no significant differences between the two groups with regard to decision uncertainty. Although women with a psychiatric history more often had experienced pressure from others to have the abortion (17.6%) than women without this history (8.7%), statistical testing revealed that these differences were not significant anymore after adjustment for confounding. Women in the psychiatric history group more often experienced the unintended pregnancy as burdensome (70.1%) than women in the no-psychiatric-history group (52.9%); after covariate adjustment the odds to have experienced the pregnancy as burdensome were over two times greater for women in the psychiatric history group than for women in the no-psychiatric-history group (OR = 2.23; CI = 1.34–3.70; $p = .002$). Women with a psychiatric history also more often experienced the abortion treatment as burdensome (40.3%) than women in the no-psychiatric-history group (26.2%); after adjustment the odds were almost two times greater for the psychiatric history group (OR = 1.93; CI = 1.12–3.34; $p = .02$). In both cases, these results only held for respondents with internalizing disorders only or comorbid internalizing and externalizing disorders.

Results of linear regression analyses are displayed in Table 3. Psychiatric history was significantly associated with negative postabortion emotions ($\beta = .16$; CI = .05–.28; $p = .004$), and this was predominant in women with internalizing disorders only. Psychiatric history was unrelated to positive emotions. Women with a psychiatric history scored lower on self-efficacy than women without this history ($\beta = -.11$; CI = $-.22$ to $-.00$; $p = .04$), and the betas for the subgroups internalizing disorders and comorbid disorders were comparable to this. Psychiatric history was also associated with the use of both emotion-oriented coping ($\beta = .22$; CI = .11–.33; $p < .001$) and avoidance-oriented coping ($\beta = .12$; CI = .01–.24; $p = .03$). For emotion-oriented coping, the pattern of results more or less held for all subgroups, but for avoidance-oriented coping the results only held for the comorbid group.

4. Discussion

This study shows that women with a history of MDs in general experience the unintended pregnancy and the abortion as more burdensome; they experience more preabortion doubts and postabortion negative emotions, report lower postabortion self-efficacy and use more emotion-oriented and avoidance-oriented coping strategies than women without this history. Our results indicate that psychiatric history strongly affects how women experience the period before and after the abortion.

Doubt or ambivalence in the abortion decision process is common, but most women feel they are making the right decision [3,5]. In line with this, we also found that most women stood behind their decision; even when preabortion doubt was high. Decision uncertainty was low in general and not affected

Table 1
Description of the Dutch Abortion and Mental Health Study (DAMHS) sample.

	No history of MD ^a (n=103)	History of any MD (n=222)	Total abortion sample (n=325)
Outcome measures			
Decision difficulty [n (%)]			
Doubt (to large or very large extent)	21 (20.4)	84 (37.8)	105 (32.3)**
Decision uncertainty (to large or very large extent)	8 (7.8)	23 (10.5)	31 (9.6)
Experienced pressure (to moderate, large or very large extent)	9 (8.7)	39 (17.6)	48 (14.8)*
Experienced burden [n (%)]			
Of the unintended pregnancy (to large or very large extent)	54 (52.9)	155 (70.1)	209 (64.7)*
Of the abortion treatment (to large or very large extent)	27 (26.2)	89 (40.3)	116 (35.8)*
Postabortion emotions [mean (SD^b)]			
Positive emotions scale ^c (2 items, range=2–10)	7.66 (2.05)	7.32 (2.24)	7.43 (2.18)
Negative emotions scale ^d (3 items, range=3–15)	7.73 (3.31)	8.90 (3.42)	8.53 (3.42)**
Abortion-specific self-efficacy and coping [mean (SD)]			
Self-efficacy ^e (range=1–5)	3.60 (.98)	3.28 (1.00)	3.38 (1.00)**
Emotion-oriented coping scale (7 items, range=7–35)	13.73 (5.35)	16.97 (6.61)	15.94 (6.41)***
Avoidance-oriented coping scale (7 items, range=7–35)	16.76 (6.88)	19.43 (6.83)	18.58 (6.95)**
Sociodemographics and abortion-related variables			
Age [mean (SD)]	31.49 (8.44)	29.03 (7.15)	29.81 (7.66)**
Living situation [n (%)]			
With partner	62 (60.2)	84 (37.8)	146 (44.9)***
Living apart together	32 (31.1)	100 (45.0)	132 (40.6)*
No partner (single)	9 (8.7)	38 (17.1)	47 (14.5)*
Unstable relationship with progenitor [n (%)]	12 (11.7)	48 (21.6)	60 (18.5)*
One or more children [n (%)]	67 (65.0)	108 (48.6)	175 (53.8)**
Non-western ethnicity [n (%)]	19 (18.4)	50 (22.5)	69 (21.2)
Unemployed [n (%)]	31 (30.1)	64 (28.8)	95 (29.2)
Low household income [n (%)]	33 (34.7)	114 (51.8)	147 (46.7)**
Education Level [n (%)]			
Primary/lower secondary education	21 (20.4)	47 (21.2)	68 (20.9)
Higher secondary education	35 (34.0)	88 (39.6)	123 (37.8)
Higher professional education	47 (45.6)	87 (39.2)	134 (41.2)
Urban (not rural) residency [n (%)]	87 (84.5)	197 (88.7)	284 (87.4)
Gestational age ^f [mean (SD)]	7.68 (3.09)	7.79 (3.03)	7.76 (3.05)
Second trimester pregnancy terminations [n (%)]	7 (6.8)	17 (7.7)	24 (7.4)
One or more prior abortions [n (%)]	33 (32.0)	53 (23.9)	86 (26.5)

Note. Means and proportions were compared using the *F*-test and the chi-squared test, respectively.

^a MD=as measured by the CIDI 3.0 (present if onset of MD was more than 12 months ago).

^b SD=standard deviation.

^c 2 positive emotion items: “relief” and “closure.”

^d 3 negative emotion items: “guilt,” “emptiness” and “mourning/loss.”

^e Self-efficacy items: “think about babies,” “spend time around babies,” “physical intimacy” and “exposure to abortion in media.” Scale mean calculated when at least 3 out of 4 items were nonmissing.

^f Number of weeks from the first day of the last menstrual cycle to the date of abortion.

* *p*<.05.

** *p*<.01.

*** *p*<.001.

by psychiatric history, whereas preabortion doubt was higher for women with previous MDs. Experienced pressure of partner and/or family members has been found to be a predictor of postabortion distress [18,19]; however, in our sample we did not find any significant group differences for experienced pressure after we controlled for confounders. This could be due to low levels of experienced pressure in both groups. Earlier studies showed that most women experience relief after an abortion, irrespective of the presence of other emotions [3,5]. Because our positive emotion scale was largely based on the emotion “relief,” and all women scored at the high end of the scale, it comes as no surprise that we found no significant group differences regarding positive emotions. As for coping, it seems fitting

that the psychiatric history group shows more emotion- and avoidance-oriented coping because they experience more burden and negative emotions, which might need to be “regulated.” Theory and research also suggests that intense reactions to stressful events prompt more frequent use of a wide range of coping responses [34].

Results for doubt and avoidance-oriented coping were strongest for the group with comorbid internalizing and externalizing disorders. The most vulnerable group in terms of psychiatric history experiences doubt the strongest, perhaps it is most adaptive for this group to use avoidance coping to deal with the irreversible abortion afterwards. Experienced burden and emotion-oriented coping were

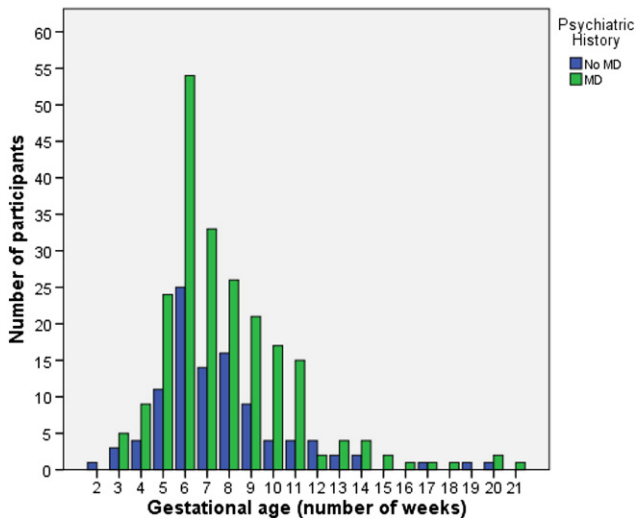


Fig. 1. Gestational age (pregnancy duration) in number of weeks from the first day of the last menstrual cycle to the date of abortion, for participants with (n=222, green) and without (n=103, blue) a history of MDs.

strongest for both the comorbid group and the internalizing disorders group. Negative postabortion emotions were strongest among women with internalizing disorders only. Because negative emotions are a core characteristic of internalizing disorders, such as depression [35], it could be expected to see them more often among women with internalizing disorders.

This study has several limitations. First, the response rate was relatively low. Yet, the sample was only slightly selective compared to the abortion clinic population. The abortion clinic population is younger, more often single, lower educated and

of nonwestern origin than our sample [14]. These characteristics are usually associated with a higher prevalence of MDs [36]. Therefore, if any bias would have occurred, our results are most likely to be conservative. Second, the group of women with externalizing disorders only was relatively small, which might have resulted in the absence of significant results in this group. Third, our measures were often one-single items or short versions of questionnaires. To do justice to the rich variety of experiences and complexity of the decision process, qualitative methods can be highly informative.

Despite these limitations, our study is strong because it combines the results of a highly reliable and valid diagnostic instrument, the CIDI 3.0, with pre- and postabortion experience variables. Our findings indicate that psychiatric history is highly relevant for pre- and postabortion experiences. Therefore, when investigating mental health consequences of abortion, preabortion mental health should be taken into account. From our results, we do not know whether a more difficult abortion decision process and a more stressful postabortion experience have long-term mental health consequences. Nevertheless, when women show a particularly difficult decision process or extremely negative responses postabortion, this might alert abortion clinicians to possible underlying psychiatric problems, unrelated to the abortion. Women with a psychiatric history might also benefit from extra support, in order to alleviate stress around the abortion. However, our results do not imply that this specific group would need or benefit from a mental health intervention. First of all, the lifetime disorders might not be present anymore at the time of abortion, and second, need for treatment of psychiatric disorders is a highly complex issue which cannot be based on diagnosis only [37].

Table 2

ORs^a (and 95% CIs) from logistic regression analyses for abortion decision difficulty and experienced burden of the abortion treatment and the unintended pregnancy, with predictor psychiatric history and type of psychiatric history.

	n	Abortion decision difficulty						Experienced burden			
		Doubt		Decision uncertainty		Experienced pressure		Unintended pregnancy burden		Abortion treatment burden	
		OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Psychiatric history											
No MD ^b	103	ref		ref		ref		ref		ref	
Any MD	222	2.30 (1.29 to 4.09)	.006	1.50 (.60 to 3.76)	.38	2.02 (.92 to 4.43)	.08	2.23 (1.34 to 3.70)	.002	1.93 (1.12 to 3.34)	.02
Type of psychiatric history											
No MD	103	ref		ref		ref		ref		ref	
Int ^c MD only	106	1.66 (.87 to 3.18)	.13	1.46 (.53 to 4.05)	.47	2.15 (.86 to 5.39)	.10	2.16 (1.20 to 3.89)	.01	1.92 (1.03 to 3.48)	.04
Ext ^d MD only	30	2.13 (.82 to 5.07)	.13	1.42 (.32 to 6.29)	.64	2.92 (.93 to 9.18)	.07	.87 (.37 to 2.02)	.74	1.78 (.73 to 4.32)	.20
Comorbid int+ext MD	86	2.88 (1.47 to 5.63)	.002	1.53 (.51 to 4.57)	.45	2.41 (.96 to 6.01)	.06	2.86 (1.47 to 5.56)	.002	1.99 (1.02 to 3.76)	.04

^a ORs are adjusted for covariates age, living situation, children and household income.

^b MD=as measured by the CIDI 3.0 (present if onset of MD was more than 12 months ago).

^c Internalizing disorders were mood disorders (major depression, dysthymia, bipolar disorder) and anxiety disorders (panic disorder, agoraphobia, social phobia, specific phobia, generalized anxiety disorder).

^d Externalizing disorders were substance use disorders (alcohol/drug abuse and dependence), childhood impulse control disorders (attention deficit hyperactivity disorder, conduct disorder, oppositional defiant disorder) and antisocial personality disorder.

Table 3

Standardized beta's^a (and 95% CIs) from linear regression analyses for postabortion emotions and postabortion self-efficacy and coping with predictor psychiatric history and type of psychiatric history.

	n	Postabortion emotions				Postabortion self-efficacy and coping					
		Positive emotions		Negative emotions		Postabortion self-efficacy		Emotion-oriented coping		Avoidance-oriented coping	
		Beta (95% CI)	p	Beta(95% CI)	p	Beta (95% CI)	p	Beta (95% CI)	p	Beta (95% CI)	p
Psychiatric history											
No MD ^b	103	ref		ref		ref		ref		ref	
Any MD	222	-.04 (-.15 to .07)	.48	.16 (.05 to .28)	.004	-.11 (-.22 to .00)	.04	.22 (.11 to .33)	<.001	.12 (.01 to .24)	.03
Type of psychiatric history											
No MD	103	ref		ref		ref		ref		ref	
Int ^c MD only	106	-.05 (-.18 to .09)	.49	.20 (.06 to .33)	.004	-.12 (-.25 to .01)	.07	.24 (.11 to .37)	<.001	.11 (-.02 to .24)	.10
Ext ^d MD only	30	-.10 (-.22 to .03)	.12	.08 (-.04 to .20)	.19	-.05 (-.17 to .07)	.44	.12 (.00 to .24)	.05	.08 (-.04 to .20)	.20
Comorbid int+ext MD	86	.05 (-.09 to .18)	.48	.13 (-.01 to .26)	.06	-.12 (-.25 to .01)	.08	.19 (.06 to .32)	.004	.18 (.05 to .31)	.007

^a Beta's are adjusted for covariates age, living situation, children and household income.

^b MD=as measured by the CIDI 3.0 (present if onset of MD was more than 12 months ago).

^c Internalizing disorders were mood disorders (major depression, dysthymia, bipolar disorder) and anxiety disorders (panic disorder, agoraphobia, social phobia, specific phobia, generalized anxiety disorder).

^d Externalizing disorders were substance use disorders (alcohol/drug abuse and dependence), childhood impulse control disorders (attention deficit hyperactivity disorder, conduct disorder, oppositional defiant disorder) and antisocial personality disorder.

Acknowledgements

This research has been funded by the Dutch Ministry of Health, Welfare, and Sport; Netherlands Organization for Health Research and Development (ZonMw), Grant number 127000003. No other financial support was received.

References

- Major B, Appelbaum M, Beckman L, Dutton MA, Russo NF, West C. Abortion and mental health: evaluating the evidence. *Am Psychol* 2009;64(9):863–90, <http://dx.doi.org/10.1037/a0017497>.
- Weitz TA, Moore K, Gordon R, Adler N. You say "regret" and I say "relief": a need to break the polemic about abortion. *Contraception* 2008;78(2):87–9, <http://dx.doi.org/10.1016/j.contraception.2008.04.116>.
- Rocca CH, Kimpfort K, Gould H, Foster DG. Women's emotions one week after receiving or being denied an abortion in the United States. *Perspect Sex Reprod Health* 2013;45(3):122–31, <http://dx.doi.org/10.1363/4512213>.
- Major B, Cozzarelli C, Cooper ML, Zubek J, Richards C, Wilhite M, et al. Psychological responses of women after first-trimester abortion. *Arch Gen Psychiatry* 2000;57(8):777–84, <http://dx.doi.org/10.1001/archpsyc.57.8.777>.
- Kero A, Lalos A. Ambivalence - a logical response to legal abortion: a prospective study among women and men. *J Psychosom Obstet Gynaecol* 2000;21(2):81–91, <http://dx.doi.org/10.3109/01674820009075613>.
- Monroe SM, Simons AD. Diathesis-stress theories in the context of life stress research: implications for the depressive disorders. *Psychol Bull* 1991;110(3):406–25, <http://dx.doi.org/10.1037/0033-2909.110.3.406>.
- Ormel J, Neeleman J. Towards a dynamic stress-vulnerability model of depression. The role of neuroticism, life events and gender. In: & Harris T, editor. *Where inner and outer worlds meet*; 2000, pp. 151–69. [Routledge: London].
- Wallin Lundell I, Sundström Poromaa I, Frans Ö, Helström L, Högborg U, Moby L, et al. The prevalence of posttraumatic stress among women requesting induced abortion. *Eur J Contracept Reprod Health Care* 2013;18(6):480–8, <http://dx.doi.org/10.3109/13625187.2013.828030>.
- Steinberg JR, Becker D, Henderson JT. Does the outcome of a first pregnancy predict depression, suicidal ideation, or lower self-esteem? Data from the National Comorbidity Survey. *Am J Orthopsychiatry* 2011;81(2):193–201, <http://dx.doi.org/10.1111/j.1939-0025.2011.01088.x>.
- Pedersen W. Abortion and depression: a population-based longitudinal study of young women. *Scand J Public Health* 2008;36(4):424–8, <http://dx.doi.org/10.1177/1403494807088449>.
- Steinberg JR, Russo NF. Abortion and anxiety: what's the relationship? *Soc Sci Med* 2008;67(2):238–52, <http://dx.doi.org/10.1016/j.socscimed.2008.03.033>.
- Fergusson DM, Horwood LJ, Boden JM. Abortion and mental health. *Br J Psychiatry* 2009;194(4):377–8, <http://dx.doi.org/10.1192/bjp.194.4.377b>.
- Mota NP, Burnett M, Sareen J. Associations between abortion, mental disorders, and suicidal behaviour in a nationally representative sample. *Can J Psychiatry* 2010;55(4):239–47.
- van Ditzhuijzen J, ten Have M, de Graaf R, van Nijmegen CHCJ, Vollebergh WAM. Psychiatric history of women who have had an abortion. *J Psychiatr Res* 2013;47(11):1737–43, <http://dx.doi.org/10.1016/j.jpsychires.2013.07.024>.
- Steinberg JR, Finer LB. Examining the association of abortion history and current mental health: a reanalysis of the national comorbidity survey using a common-risk-factors model. *Soc Sci Med* 2011;72(1):72–82, <http://dx.doi.org/10.1016/j.socscimed.2010.10.006>.
- Steinberg JR, McCulloch CE, Adler NE. Abortion and mental health: findings from The National Comorbidity Survey-Replication. *Obstet Gynecol* 2014;123(2):263–70, <http://dx.doi.org/10.1097/AOG.0000000000000092>.
- American Psychological Association. Task Force on Mental Health and Abortion. Report of the APA task force on mental health and abortion. Washington, DC: APA; 2008 [Available from: <http://www.apa.org/pi/women/programs/abortion/mental-health.pdf>].
- Söderberg H, Janzon L, Sjöberg N. Emotional distress following induced abortion: a study of its incidence and determinants among abortees in Malmö, Sweden. *Eur J Obstet Gynecol Reprod Biol* 1998;79(2):173–8, [http://dx.doi.org/10.1016/s0301-2115\(98\)00084-0](http://dx.doi.org/10.1016/s0301-2115(98)00084-0).
- National Collaborating Centre for Mental Health. Induced abortion and mental health: a systematic review of the mental health outcomes of induced abortion, including their prevalence and associated factors. London: Academy of Medical Royal Colleges; 2011 [Available from: <http://www.nccmh.org.uk/reports/>].
- Cozzarelli C. Personality and self-efficacy as predictors of coping with abortion. *J Pers Soc Psychol* 1993;65(6):1224–36, <http://dx.doi.org/10.1037/0022-3514.65.6.1224>.
- Grant DM, Wingate LR, Rasmussen KA, Davidson CL, Slish ML, Rhoades-Kerswill S, et al. An examination of the reciprocal relationship between avoidance coping and symptoms of anxiety and

- depression. *J Soc Clin Psychol* 2013;32(8):878–96, <http://dx.doi.org/10.1521/jscp.2013.32.8.878>.
- [22] Charles VE, Polis CB, Sridhara SK, Blum RW. Abortion and long-term mental health outcomes: a systematic review of the evidence. *Contraception* 2008;78(6):436–50, <http://dx.doi.org/10.1016/j.contraception.2008.07.005>.
- [23] Martino SC, Collins RL, Ellickson PL, Klein DJ. Exploring the link between substance abuse and abortion: the roles of unconventionality and unplanned pregnancy. *Perspect Sex Reprod Health* 2006;38(2):66–75, <http://dx.doi.org/10.1111/j.1931-2393.2006.tb00062.x>.
- [24] Pedersen W, Mastekaasa A. Conduct disorder symptoms and subsequent pregnancy, child-birth and abortion: a population-based longitudinal study of adolescents. *J Adolesc* 2011;34(5):1025–33, <http://dx.doi.org/10.1016/j.adolescence.2010.11.005>.
- [25] Alonso J, Angermeyer MC, Bernert S, Bruffaerts R, Brugha TS, Bryson H, et al. Sampling and methods of the european study of the epidemiology of mental disorders (ESEMeD) project. 2004;109(s420):8–0, <http://dx.doi.org/10.1111/j.1600-0047.2004.00326>.
- [26] De Graaf R, ten Have M, van Dorsselaer S. The Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2): Design and methods. *Int J Methods Psychiatr Res* 2010;19(3):125–41, <http://dx.doi.org/10.1002/mpr.317>.
- [27] de Graaf R, Ormel J, ten Have M, Burger H, Buist-Bouwman M. Mental disorders and service use in the Netherlands. Results from the european study of the epidemiology of mental disorders (ESEMeD). In: Kessler RC, & Ustun TB, editors. *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders*. Cambridge: Cambridge University Press; 2008, pp. 388–405.
- [28] Haro JM, Arbabzadeh-Bouchez S, Brugha TS, De Girolamo G, Guyer ME, Jin R, et al. Concordance of the Composite International Diagnostic Interview version 3.0 (CIDI 3.0) with standardized clinical assessments in the WHO world mental health surveys. *Int J Methods Psychiatr Res* 2006;15(4):167–80, <http://dx.doi.org/10.1002/mpr.196>.
- [29] Wittchen HU. Reliability and validity studies of the WHO–Composite International Diagnostic Interview (CIDI): a critical review. *J Psychiatr Res* 1994;28(1):57–84, [http://dx.doi.org/10.1016/0022-3956\(94\)90036-1](http://dx.doi.org/10.1016/0022-3956(94)90036-1).
- [30] Major B, Richards C, Cooper ML, Cozzarelli C, Zubeck J. Personal resilience, cognitive appraisals, and coping: an integrative model of adjustment to abortion. *J Pers Soc Psychol* 1998;74(3):735–52.
- [31] Calsbeek H, Rijken M, Bekkers MJTM, Van BH, Dekker J. Coping in adolescents and young adults with chronic digestive disorders: impact on school and leisure activities. *Psychol Health* 2006;21(4):447–62, <http://dx.doi.org/10.1080/14768320500410910>.
- [32] Endler NS, Parker JDA. *Coping inventory for stressful situations (CISS): manual*. 2nd ed. Toronto: Multi Health Systems; 1999.
- [33] Ten Have M, Oldehinkel A, Vollebergh W, Ormel J. Does neuroticism explain variations in care service use for mental health problems in the general population? Results from the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Soc Psychiatry Psychiatr Epidemiol* 2005;40(6):425–31, <http://dx.doi.org/10.1007/s00127-005-0916-z>.
- [34] Zimmer-Gembeck MJ, Skinner EA, Morris H, Thomas R. Anticipated coping with interpersonal stressors: links with the emotional reactions of sadness, anger, and fear. *J Early Adolesc* 2012;33(5):684–709, <http://dx.doi.org/10.1177/0272431612466175>.
- [35] American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 4th ed. Washington, DC: Author; 2000 [text rev].
- [36] de Graaf R, ten Have M, van Dorsselaer S. *De psychische gezondheid van de Nederlandse bevolking. NEMESIS-2: Opzet en eerste resultaten*. Utrecht: Netherlands Institute of Mental Health and Addiction; 2010.
- [37] Ten Have M, Nuyen J, Beekman A, De Graaf R. Common mental disorder severity and its association with treatment contact and treatment intensity for mental health problems. *Psychol Med* 2013;43(10):2203–13, <http://dx.doi.org/10.1017/S0033291713000135>.