

Psychological Impact on Women of Miscarriage Versus Induced Abortion: A 2-Year Follow-up Study

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Objective: To compare the psychological trauma reactions of women who had either a miscarriage or an induced abortion, in the 2 years after the event. Further, to identify important predictors of Impact of Event Scale (IES) scores. **Method:** A consecutive sample of women who experienced miscarriage ($N = 40$) or induced abortion ($N = 80$) were interviewed 3 times: 10 days (T1), 6 months (T2), and 2 years (T3) after the event. **Results:** At T1, 47.5% of the women who had a miscarriage were cases (IES score 19 points on 1 or both of the IES subscales), compared with 30% for women who had an induced abortion ($p = .60$). The corresponding values at T3 were 2.6% and 18.1%, respectively ($p = .019$). At all measurement time points, the group who had induced abortion scored higher on IES avoidance. Women who had a miscarriage were more likely to experience feelings of loss and grief, whereas women who had induced abortion were more likely to experience feelings of relief, guilt, and shame. At T3, IES intrusion was predicted by feelings of loss and grief at T1, whereas avoidance at T3 was predicted by guilt and shame at T1. **Conclusion:** The short-term emotional reactions to miscarriage appear to be larger and more powerful than those to induced abortion. In the long term, however, women who had induced abortion reported significantly more avoidance of thoughts and feelings related to the event than women who had a miscarriage. **Key words:** miscarriage, induced abortion, psychological impact, Impact of Event Scale, posttraumatic stress disorder.

PTSD = posttraumatic stress disorder; **IES** = Impact of Event Scale; **OLS** = ordinary least squares.

INTRODUCTION

Miscarriage (spontaneous abortion) has always been a possible outcome of pregnancy. Induced abortion is of more recent origin. In Norway, induced abortion within the first 12 weeks of pregnancy became an unconditional legal right in 1978. Norway has 4.5 million inhabitants, and over the period of the last 10 years, the number of induced abortions has stabilized at approximately 15,000 per year. This corresponds to a rate of 12.6 to 14.8 induced abortions per 1000 women age 15 to 49 years, per year (1). The number of miscarriages treated in hospitals is approximately 8000 to 10,000 per year.

Miscarriage and induced abortion have similarities and differences. They have in common the fact that the woman has aborted after a short term of pregnancy. Seemingly, the event generates a problem for women who experience a miscarriage, whereas it solves a problem for women who sought an induced abortion.

Research on psychological responses of women after a miscarriage shows that many suffer from grief, guilt, depression, and anxiety (2–8). Women may experience a grief reaction after miscarriage that is an adequate response to loss. Therefore, symptoms of grief must be differentiated to sort out whether it is pathological with respect to intensity and duration. In fact, lack of grief reactions may increase the risk of later depression. There is also evidence that a miscarriage may lead to acute stress disorder and posttraumatic stress disorder (PTSD; 9,10). One study shows that PTSD occurs in approximately 7% of the women 4 months after a miscarriage (11).

Research on induced abortion is not unanimous, but there has been a prevailing view that induced abortion in the first trimester generally does not cause major psychiatric or psy-

chological difficulties (12, 13). In fact, many women experience relief and increased well-being after the decision (14–16). There are some risk factors, though, that may promote negative responses after induced abortion: a past psychiatric history (13), difficulties in the decision process (12, 17), and a negative attitude toward abortion (12, 18). Women terminating a pregnancy because of fetal anomaly (usually later in the pregnancy) often experience severe distress, such as extended grieving and possible depression (19, 20).

Few studies have explored the traumatic aspect of induced abortion in the first trimester. One study used the Impact of Event Scale (IES), showing that 6 months after an abortion, 10% of the women were traumatized (21). Another study reported 1% of PTSD 2 years after an abortion (13). In spite of similarities between miscarriage and induced abortion, psychological stress responses after these events have not been compared.

Aims of the Study

The aims of the study were 1) to compare the course of the psychological stress responses (expressed by IES scores) after miscarriage and induced abortion in a 2-year prospective follow-up study; 2) to compare the intensity of feelings after miscarriage and induced abortion; and 3) to identify variables related to the psychological stress responses at 10 days and at 2 years.

METHODS

One hundred twenty women between the ages of 18 and 45 years (80 who had induced abortion and 40 who had a miscarriage), treated in the gynecology department at Buskerud Hospital (located in Drammen, a city of 55,000 citizens, 40 km west of Oslo, Norway) between April 1998 and February 1999, were consecutively included in the study. All who had induced abortion were less than 14 weeks pregnant, and no terminations were because of fetal anomaly. Of the women who had miscarried, 1 had a pregnancy of 21 weeks, and the rest were less than 17 weeks pregnant. The staff contacted the women shortly after their experience, while they were still in hospital. Those who agreed to participate were then contacted by a female psychiatrist (A.N.B.) who was working in the psychiatry department of the same hospital.

Thirteen women were excluded based on defined exclusion criteria: 1) not Norwegian-speaking ($N = 9$); 2) mentally disabled or suffering from serious psychiatric illness ($N = 3$); and 3) pregnancy after rape ($N = 1$).

Of 255 women asked to participate, 120 (47%) agreed and were included (46% of the women who had an induced abortion and 50% of those who had a miscarriage). The response rate varied between 30% and 75%, according to how motivated the staff was, and according to which person asked the women.

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There were no significant differences in the outcome between the subgroups with high and low response rate.

In the miscarriage group, there was not a significant difference in mean age between those who participated in the study (30.5 years) and those who did not (30.1 years). There also was not a significant difference in mean age between participants (27.5 years) and nonparticipants (27.7 years) in the induced abortion group. Of the 80 women who had induced abortion, 74 completed the interviews at T2, and 72 at T3. Of the 40 women in the miscarriage group, all 40 completed at T2, and 39 at T3. Thus, of the 120 women, 93% of those taking part in the project and 44% of all eligible women completed the study.

All interviews were conducted face to face by the female psychiatrist, except 2 at follow-up: 1 by telephone and 1 by mail.

Interviews

The women were interviewed 10 days (T1), 6 months (T2), and 2 years (T3) after the miscarriage or induced abortion. The interviews were semi-structured and included background data such as age, marital status, education, employment, religious faith, number of children, number of previous miscarriages or induced abortions, and mental health. In addition, the interviews contained several self-administered questionnaires.

The women's previous psychiatric health was measured in 2 ways—a self-report and a diagnostic evaluation by the interviewer:

a) Self-reported scale examining the need for psychiatric help, measured by a 6-point scale:

- 1) No help ever required from the health services.
- 2) No contact with, or help from, the health services, but 1 or several times earlier in her life the woman felt that she was in need of professional help.
- 3) The woman had 1 or several times consulted a general practitioner about psychological problems.
- 4) Previous contact with a private practitioner (psychiatrist or psychologist).
- 5) Previous treatment at a psychiatric outpatient clinic.
- 6) Previous inpatient treatment at a psychiatric ward or at a ward for substance abuse.

b) Diagnostic evaluation

After the first interview, which usually lasted approximately 1½ hours, the women were assigned 1 or more International Classifications of Diseases, 10th Edition (ICD-10) lifetime psychiatric diagnoses, if applicable.

Based on a combination of the self-report and the diagnostic evaluation, we formed a new scale, called Mental Health:

- a) Good: the woman rated herself as 1 or 2 and received no diagnosis from the psychiatrist.
- b) Medium: the woman rated herself as 1 or 2 but was given a diagnosis by the psychiatrist.
- c) Previous psychiatric problems: the woman rated herself as 3 to 6 and was given a diagnosis by the psychiatrist.

Questionnaires

The following questionnaires were completed at all time points:

Impact of Event Scale

The IES (22) has been widely used as a measure of stress reactions after traumatic events. It has a 2-factor structure, 1 measuring intrusion (flashbacks, bad dreams, and strong feelings related to the traumatic event) and 1 measuring avoidance (of thoughts and feelings related to the event). The IES version we used contains 15 questions, rated from 0 to 5, giving a total score from 0 to 75 points. Seven questions deal with intrusion (IES intrusion) and 8 with avoidance (IES avoidance).

A recent review (23) shows that the IES is a reliable index of the degree of subjective distress associated with a particular trauma.

A high score on the IES may be related to the presence of acute stress disorder or PTSD, as defined by DSM-IV. The PTSD diagnosis is based more on the appearance of intrusive criteria (ie, the 2 factors of reliving in some fashion the event and increased arousal) than on avoidance criteria. In our study, we did not use the specific criteria for giving these diagnoses. We used the term *case*, defined as women obtaining a high score, that is, more than 19 points on either of the 2 subscales, IES intrusion or IES avoidance, as according to common practice (20,24). Persons defined as intrusion or avoid-

ance cases may suffer from negative psychological responses and possibly from posttraumatic stress reactions (25).

Life Events Scale

The Life Events Scale (26) incorporates 13 questions. The women filled in how many of 12 suggested serious life events (apart from the pregnancy termination) they had experienced during the past 12 months. A further open-ended question allowed the woman to describe any other difficulties. The total score was from 0 to 13 points.

Feelings Connected to the Pregnancy Termination

We measured the intensity of various feelings that the women experienced at the time of the interview when asked to think about the pregnancy termination. They were asked to rate their feelings of relief, emptiness, grief, anger, let-down, guilt, shame, loss, and missing the fetus or child. For each feeling, they rated the intensity as follows: 1 = not at all, 2 = a little, 3 = a great deal, 4 = much, and 5 = very much.

The characteristics of the women taking part in the study are shown in Table 1. The significant differences between the 2 groups related to the number of children, marital status, and vocational activity. Women who had a miscarriage were more often married or cohabitant ($p < .005$). Women who had an induced abortion had significantly more children ($p < .05$), were more often still in school, and were less often employed ($p < .05$).

Statistics

Differences in means between miscarriage and induced abortion for linear variables were tested by Pearson r (point biserial) for continuous variables and by the coefficient ϕ for dichotomies (eg, caseness). The association between pregnancy termination group and nominal variables was tested by χ^2 . Correlations between continuous variables were assessed by Pearson r . Means for outcome variables were adjusted for possible confounding variables by ordinary least squares (OLS) methods (procedure general linear model—UNIANOVA in SPSS). The multivariate association between predictors and outcome (IES) was assessed by multiple linear regression analyses (OLS, UNIANOVA), using unstandardized regression coefficients as effect parameters. Statistical interactions were tested by entering multiplicative terms in the regression equation, 1 at a time, with controls for all main effects.

The 9 feelings associated with the pregnancy termination (loss, grief, missed fetus or child, emptiness, guilt, shame, let-down, anger, and relief) were subjected to a principal components analysis. Two distinctive factors emerged: 1 with loadings on grief, loss, missed fetus or child, and emptiness (hereafter referred to as *loss/grief*), and another with loadings on guilt, shame, let-down, and anger (hereafter referred to as *guilt/shame*). Simple additive indexes were created for both dimensions. The feeling of relief did not belong to either of the 2 primary dimensions and was retained as a separate measure. At T1, the loss/grief index correlated strongly with the guilt/shame index ($r = .58$) and with relief ($r = -.49$), whereas the correlation between guilt/shame and relief was modest ($r = -.17$).

Reliability for the additive indexes assessed by internal consistency was very satisfactory for loss/grief (Cronbach α ranging from 0.90 to 0.94 for the 3 time points) and good for guilt/shame (Cronbach α ranging from 0.72 to 0.78 for the 3 time points). Reliability, as assessed by stability coefficients (test-retest correlations between T1, T2, and T3), was satisfactory, ranging between 0.58 and 0.77 for loss/grief, between 0.63 and 0.74 for guilt/shame, and between 0.44 and 0.58 for relief. The test-retest correlations were lowest when the time difference was largest.

RESULTS

Women in the miscarriage group reported significantly more IES intrusion at T1 than women in the induced abortion group (17.6 vs. 11.9, $p < .01$), and accounted for more intrusion cases (47.5% vs. 23.8%, $p < .01$; Table 2).

Women with induced abortion reported significantly more IES avoidance at T1 than women with miscarriage (11.1 vs. 7.0, $p < .01$), but the difference in avoidance cases was not

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TABLE 1. Characteristics of the Women Participating in the Study and Their Scores on the Life Events Scale^{a,b}

	Women With Miscarriage (N = 40, Scored 1)	Women With Induced Abortion (N = 80, Scored 2)	
At T1 (10 days after the event)	Mean (95% Confidence Interval)	Mean (95% Confidence Interval)	
Age, y	30.1 (28.2–31.9)	27.7 (26.2–29.3)	$r = -.17, NS$
Length of pregnancy, wk	10.5 (9.4–11.5)	9.6 (9.3–9.9)	$r = -.18, NS$
Number of previous induced abortions	0.3 (0.1–0.5)	0.3 (0.2–0.4)	$r = -.02, NS$
Number of previous miscarriages	0.4 (0.2–0.6)	0.4 (0.2–0.6)	$r = .02, NS$
Number of children	0.8 (0.5–1.0)	1.2 (0.9–1.4)	$r = .19^*$
Marital status			$\chi^2 = 15.38^{***}$
Married	42.5%	21.3%	
Cohabitant	50.0%	37.5%	
Not married/cohabitant	7.5%	41.3%	
Education			$\chi^2 = 5.42, NS$
Comprehensive school to 16 years of age	10.0%	15.0%	
Comprehensive school to 19 years of age	15.0%	31.3%	
Vocational education	47.5%	31.3%	
University education	27.5%	22.5%	
Vocational activity			$\chi^2 = 10.34^*$
Still in education	2.5%	21.3%	
Regular employment	75.0%	50.0%	
Temporary employment	5.0%	11.3%	
Working at home	10.0%	8.8%	
Other	7.5%	8.8%	
Religious faith			$\chi^2 = 5.05, NS$
Christian, the faith is of minor importance	80.0%	71.3%	
Christian, the faith is of great importance	12.5%	6.3%	
Agnostic or humanistic ethicist	5.0%	17.5%	
Muslim or other	2.5%	5.0%	
Former psychiatric health			$\chi^2 = 3.63, NS$
Good	65.0%	47.5%	
Medium	15.0%	17.5%	
Previous psychiatric problems	20.0%	35.0%	
Life Events Scale at T1	1.8 (1.2–2.4)	1.9 (1.5–2.3)	$r = .2, NS$
Life Events Scale at T3	1.7 (1.3–2.0)	1.6 (1.3–1.9)	$r = -.3, NS$

^a χ^2 (Pearson χ^2) = for pregnancy termination group by nominal variable.

^b r (Pearson r , t test) = for pregnancy termination type by continuous variables.

* $p < .05$, ** $p < .01$, *** $p < .005$.

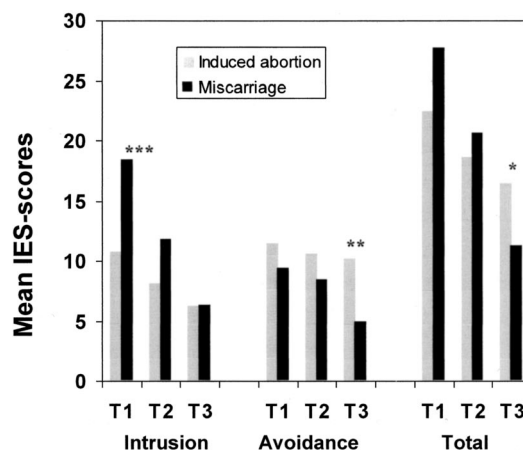
statistically significant. Also, the difference in cases altogether was not statistically significant.

At T2, the only significant difference between the 2 groups was that women in the induced abortion group had more IES avoidance (9.7 vs. 5.9, $p < .05$).

At T3, women with induced abortion had significantly more IES avoidance than women with miscarriage (9.3 vs. 3.2, $p < .005$), and more avoidance cases (16.7% vs. 2.6%, $p < .05$). Furthermore, at this time point, women who had an induced abortion had a significantly higher IES total score than women who had miscarried (14.3 vs. 8.1, $p < .01$), and significantly more cases altogether (18.1% vs. 2.6%, $p = .019$).

The 2 groups differed significantly with respect to the number of children, marital status, and vocational activity. When we adjusted for this statistically, in essence, the same findings were revealed (Fig. 1).

Table 3 shows the mean intensity of the feelings (loss, grief, missed fetus or child, emptiness, guilt, shame, let-down, anger, relief), and the means of the indexes at the 3 time points. At T3, the only significant differences were that



T1: 10 days, T2: 6 months, T3: 2 years after pregnancy termination

Difference between groups: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$

Figure 1. Mean IES scores at the 3 time points, adjusted for possible confounding variables (number of children, marital status, vocational activity) by OLS.

TABLE 2. Mean IES Scores and Percentage of IES Cases by Type of Pregnancy Termination

	T1 (10 Days After the Pregnancy Termination)			T2 (6 Months After the Pregnancy Termination)			T3 (2 Years After the Pregnancy Termination)		
	Miscarriage (1)	Induced abortion (2)	Correlations - Pearson's <i>r</i> -Phi ^{c,d}	Miscarriage (1)	Induced abortion (2)	Correlations - Pearson's <i>r</i> -Phi	Miscarriage (1)	Induced abortion (2)	Correlations - Pearson <i>r</i> ϕ
Total IES Mean, (95% Confidence Interval)	24.6 (20.4-28.7)	23.2 (19.9-26.5)	<i>r</i> = -.05 ϕ = -.017	16.5 (12.0-20.9)	17.7 (14.1-21.2)	<i>r</i> = .04 ϕ = 0.04	8.1 (5.3-10.9)	14.3 (11.1-17.5)	<i>r</i> = .24** ϕ = 0.22*
% Cases ^a	47.5%	30.0%		22.5%	25.7%		2.6%	18.1%	
IES intrusion Mean (95% Confidence Interval)	17.6 (14.5-20.6)	11.9 (9.8-14.0)	<i>r</i> = -.28** ϕ = -.024**	10.6 (7.8-13.4)	8.0 (6.0-10.0)	<i>r</i> = -.14 ϕ = -.009	4.9 (3.2-6.6)	5.1 (3.7-6.4)	<i>r</i> = .01 ϕ = 0.07
% Cases ^b	47.5%	23.8%		20.0%	13.5%		0%	1.4%	
IES avoidance Mean (95% Confidence Interval)	7.0 (5.0-8.9)	11.1 (9.3-12.8)	<i>r</i> = .26** ϕ = 0.08	5.9 (3.8-7.9)	9.7 (7.7-11.7)	<i>r</i> = -.23* ϕ = 0.15	3.2 (1.7-4.7)	9.3 (7.1-11.5)	<i>r</i> = .34*** ϕ = 0.21*
% Cases ^b	7.5%	12.5%		7.5%	18.9%		2.6%	16.7%	

^a >19 Points on 1 or both subscales.

^b >19 Points on subscale.

^c *r* (Pearson *r*/point biserial) = for type of pregnancy termination by continuous variables.

^d ϕ = Dichotomy for pregnancy termination type by caseness.

* $p < .05$, ** $p < .01$, *** $p < .005$.

women with miscarriage felt more grief, and women with induced abortion felt more relief, guilt, and shame.

Adjusted for confounding variables, women had miscarried felt significantly more loss/grief at T1 ($p < .005$) and at T2 ($p < .005$) than the induced abortion group. The induced abortion group had significantly more relief across all time points ($p < .005$). However, the differences in guilt/shame between the groups were no longer statistically significant at any time point after adjusting for the confounding variables.

Table 4 shows the multiple regression analyses on the IES intrusion and avoidance scores at T1. As independent variables, we entered those background variables and other potential predictors at T1 (including both the Life Events Scale and the feeling indexes at T1) that had shown the strongest impact ($p < .01$) on the IES scores at T1 and/or at T3 bivariate (unadjusted).

In the adjusted model, only the feeling index loss/grief remained significant ($p < .005$), resulting in higher IES1 intrusion scores.

In the adjusted model, only women scoring high on the guilt/shame feeling index showed significantly higher IES1 avoidance scores ($p < .005$).

Table 5 shows the multiple regression analyses on the IES intrusion and avoidance scores at T3. We used the same variables as in Table 4.

After 2 years, the feeling indexes of loss/grief and guilt/shame (at T1) were significant predictors of high IES3 intrusion, both unadjusted and adjusted. In the adjusted model, only women with induced abortion and those high on the guilt/shame feeling index (at T1) showed significantly higher IES3 avoidance scores. The feeling relief (at T1) had no significant influence on the IES scores at T3, unadjusted or adjusted.

Life events at T3 were shown to influence significantly bivariate IES3 intrusion ($\beta = 3.44$, $p < .005$). In the multiple regression analysis, it was still significant ($\beta = 3.21$, $p < .005$) on IES3 intrusion. Including this variable in the multiple regression analysis made only small changes to the significance of the other most important variables.

Statistical Interaction

Looking individually at feelings at the item level, the impact of the feeling of guilt at T1 on IES3 avoidance was significantly different for the 2 pregnancy termination groups. For women with miscarriage, there was no association between guilt and avoidance ($r = .02$, NS), whereas for women with induced abortion, there was a highly significant relationship ($r = .43$, $p < .005$). This statistical interaction remained significant ($\beta = 5.28$, $p = .021$) when controlling for age, mental health, and marital status.

DISCUSSION

The main results of the current study are the high IES intrusion scores of women who had miscarried 10 days after the event, but not at the 2-year follow-up, and the high IES avoidance scores of women with induced abortion during the 2 years after the abortion. These findings remain when adjusted for possible confounding variables.

The total number of cases reflects the high scores: at T1,

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TABLE 3. Intensity of Feelings Related to the Pregnancy Termination by Type of Pregnancy Termination

	T1 (10 Days After the Pregnancy Termination)			T2 (6 Months After the Pregnancy Termination)			T3 (2 Years After the Pregnancy Termination)		
	Miscarriage (1)	Induced abortion (2)	Pearson <i>r</i>	Miscarriage (1)	Induced abortion (2)	Pearson <i>r</i>	Miscarriage (1)	Induced abortion (2)	Pearson <i>r</i>
Intensity of the feeling (rated 1–5)	<i>N</i> = 40	<i>N</i> = 80		<i>N</i> = 40	<i>N</i> = 74		<i>N</i> = 39	<i>N</i> = 72	
Loss	3.6	2.2	-.41***	3.4	2.2	-.39***	2.5	2.2	-.12
Grief	3.7	2.4	-.40***	3.2	2.2	-.34***	2.4	1.9	-.23*
Miss fetus/child	3.2	2.0	-.38***	3.3	2.2	-.36***	2.3	2.1	-.11
Emptiness	3.4	2.4	-.31**	2.9	2.4	-.18	2.3	1.9	-.17
Four feelings in an index:	3.5	2.3	-.41***	3.2	2.3	-.36***	2.4	2.0	-.17
Loss/grief									
Guilt	1.9	2.1	.10	1.5	2.1	.25**	1.2	1.9	.31**
Shame	1.1	1.8	.32***	1.1	1.9	.33***	1.1	1.6	.29**
Let-down	1.5	1.5	-.01	1.5	1.9	.18	1.5	1.7	.10
Anger	2.2	1.8	-.15	2.0	1.9	-.03	1.5	1.8	.10
Four feelings in an index:	1.7	1.8	.07	1.5	2.0	.23*	1.3	1.7	.26**
Guilt/shame									
Relief	1.3	2.8	.50***	1.3	2.6	.47***	1.3	2.7	.48***

Significance for *r* (by *t* test): * *p* < .05, ** *p* < .01, *** *p* < .005.

TABLE 4. Multiple Linear Regression Analyses Showing the Influence of the Most Significant Background Variables on IES Scores in the 2 Pregnancy Termination Groups 10 Days After the Pregnancy Termination (T1)

Variables at T1	IES1 Intrusion		IES1 Avoidance	
	Unadjusted B (SE)	Adjusted B (SE)	Unadjusted B (SE)	Adjusted B (SE)
Pregnancy termination type				
Miscarriage	1.00	1.00	1.00	1.00
Induced abortion	-5.65 (1.82)**	-0.80 (1.65)	4.09 (1.43)**	1.72 (1.67)
Age				
18–24 y	1.00	1.00	1.00	1.00
25–34 y	-3.90 (1.98)	-2.01 (1.48)	-4.65 (1.52)**	-1.63 (1.50)
35–45 y	2.13 (2.39)	-0.04 (1.70)	-0.27 (1.84)	0.45 (1.72)
Marital status				
Married	1.00	1.00	1.00	1.00
Cohabitant	-2.18 (2.17)	-0.76 (1.48)	-0.24 (1.60)	-0.31 (1.49)
Not married/cohabitant	0.13 (2.33)	1.33 (1.79)	5.41 (1.72)**	2.74 (1.81)
Mental health				
Good	1.00	1.00	1.00	1.00
Medium	2.82 (2.42)	1.21 (1.70)	3.56 (1.84)	1.76 (1.72)
Previous psychiatric problems	6.18 (1.96)**	2.08 (1.48)	5.88 (1.50)***	2.01 (1.49)
Feelings at T1				
Loss/grief	5.21 (0.42)***	4.08 (0.64)***	0.98 (0.49)*	-0.14 (0.65)
Guilt/shame	5.39 (0.81)***	0.98 (0.85)	3.93 (0.65)***	3.22 (0.86)***
Relief	-3.05 (0.58)***	-0.90 (0.53)	0.22 (0.50)	0.09 (0.54)
Multiple R ² _{adj}	—	0.582	—	0.298

* *p* < .05, ** *p* < .01, *** *p* < .005; reference values are set at 1.00.

47.5% of the women with miscarriage were cases, compared with 30% for women with induced abortion (*p* = .60). The corresponding values at T3 were 2.6% and 18.1%, respectively (*p* = .019).

Women who had a miscarriage had more feelings of loss/

grief, but the feeling intensity fell significantly, approaching the same level as for women with induced abortion.

Women with induced abortion had more feelings of relief and shame at all time points, and more feeling of guilt at T2 and T3. However, when adjusted for confounding variables,

TABLE 5. Multiple Linear Regression Analyses Showing the Influence of the Most Significant Background Variables on IES Scores in the 2 Pregnancy Termination Groups, 2 Years After Pregnancy Termination (T3)

Variables at T1	IES3 Intrusion		IES3 Avoidance	
	Unadjusted B (SE)	Adjusted B (SE)	Unadjusted B (SE)	Adjusted B (SE)
Pregnancy termination type				
Miscarriage	1.00	1.00	1.00	1.00
Induced abortion	0.16 (1.10)	1.15 (1.32)	6.07 (1.60)***	4.48 (1.93)*
Age				
18–24 y	1.00	1.00	1.00	1.00
25–34 y	–1.56 (1.20)	–0.24 (1.21)	–5.69 (1.79)**	–2.87 (1.76)
35–45 y	0.16 (1.47)	–0.28 (1.40)	–2.18 (2.20)	–1.31 (2.04)
Marital status				
Married	1.00	1.00	1.00	1.00
Cohabitant	–1.02 (1.26)	–0.59 (1.18)	1.25 (1.91)	1.40 (1.73)
Not married/cohabitant	0.51 (1.41)	0.36 (1.50)	5.14 (2.14)*	1.95 (2.19)
Mental health				
Good	1.00	1.00	1.00	1.00
Medium	1.12 (1.45)	0.36 (1.36)	1.55 (2.22)	–0.54 (1.99)
Previous psychiatric problems	1.70 (1.20)	–0.90 (1.18)	3.92 (1.83)*	–0.92 (1.73)
Feelings at T1				
Loss/grief	1.59 (0.34)***	1.22 (0.52)*	0.99 (0.56)	1.04 (0.76)
Guilt/shame	2.86 (0.50)***	1.88 (0.69)**	4.15 (0.79)***	3.31 (1.00)**
Relief	–0.45 (0.37)	0.19 (0.43)	1.07 (0.58)	1.19 (0.62)
Multiple R ² _{adj}	—	0.210	—	0.299

* $p < .05$, ** $p < .01$, *** $p < .005$; reference values are set at 1.00.

the feeling index guilt/shame was at no time significantly different between the 2 abortion groups. The confounding variables making changes in guilt/shame (rather small changes, but enough to take away the statistical difference between the abortion groups) were marital status and vocational activity. The women with induced abortion were more often single, unmarried, and still in education than women with miscarriage. These characteristics led to more feelings of guilt/shame connected to the event.

We found a statistical interaction between pregnancy termination type and guilt (at T1) on IES3 avoidance scores. This may give an indication that the guilt felt by women who had an induced abortion was deeper and more powerful than the guilt felt by women who had miscarried.

Women with miscarriage experience a shock-like event when the pregnancy termination occurs. This may be a frightening experience and can explain the high IES intrusion scores a few days later. This finding is in accordance with other studies (6, 9–11) also reporting a substantial degree of posttraumatic symptoms.

The women with induced abortion also scored high on the IES, especially on IES avoidance during the 2 years after the abortion.

Major et al. (13) reported 1% PTSD 2 years after induced abortion. In our study, 18.1% of the women with induced abortion were cases 2 years after the abortion, most of them avoidance cases. IES avoidance gives an indication of avoidance of thoughts and feelings connected to the pregnancy termination event. The presence of avoidance can correspond with repressive and suppressive tendencies associated with PTSD, but it may also be a marker for the social stigma and resulting shame and secrecy associated both with having become pregnant and having an induced abortion. Considering the rather low number of intrusion cases in the induced abor-

tion group, the psychological burden may be somewhat less than the number of avoidance cases may indicate. In our study, women from both the city and the countryside participated. Most of them belonged to a Christian, non-Catholic tradition, and induced abortion within the first 12 weeks of pregnancy had been an unconditional legal right for more than 20 years. This should make our results of general interest to most other Western countries.

Being an IES case is not equated to having PTSD, but the trend of the results in our study and in an American study (13), especially 2 years after an induced abortion, gives the impression of a somewhat different outcome. There may be cultural differences between Norway and the United States, but it appears unlikely that these should explain the disparity between the studies.

Other studies have shown that women with poor mental health develop more problems after a pregnancy termination than healthier women do (13, 27). In our study, mental health before the event surprisingly had no significant independent influence on the IES scores.

Limitations and Strengths of the Study

Only 47% of all eligible women participated. The participation rate differed considerably according to the motivation of the staff asking the women to take part in the study. Thus, much of the resistance was in the staff. The IES scores did not differ, however, between subgroups with highly divergent participation rates, indicating a representativeness that is better than what could be feared from the moderate response rate.

In what way may the low participation rate influence the results of the study? People with large problems connected to an event often do not want to participate in studies like these. Weisaeth (28) found that there was a connection between the

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seriousness of traumatic symptoms and unwillingness to participate in studies about the trauma. Thus, it is more probable that the low participation rate will lead us to underestimate, rather than overestimate, the problems connected to a miscarriage or an induced abortion. However, low response rates can be explained by reasons other than pathology. For example, if miscarriage and abortion evoke reactions because of shame and perceived stigma, women may choose not to participate. This possibility is in accordance with the observation that staff who were motivated and probably showed more openness about the losses obtained higher response rates.

The method of deciding the previous mental health of the women can be disputed. The women might have had a recall bias, underestimating their former need for psychiatric help. In our study, the interviewer had no other piece of information before giving lifetime diagnoses. Combining the 2 diagnostic methods may have given a better diagnostic outcome.

We have used the IES and the scores on feelings in describing the mental health status after pregnancy loss. To give a more complete picture of the psychological responses, more comprehensive mental health scales should also be included in the evaluation.

The 93% follow-up rate strengthens the study. Norway is a small country and has an advanced system for registration of its inhabitants, making follow-up studies easier than in many other countries.

The fact that the women were followed up for 2 years also strengthens the study. As mentioned by other authors (13), a follow-up period as long as 5 or even more years would give better information about the true long-term consequences of pregnancy termination.

We had no control group of women who initially wanted an induced abortion but who were denied abortion or for other reasons continued the pregnancy until birth. A review article (15) reports that many women denied abortion show ongoing resentment that may last for years, and children born when the abortion is denied have numerous broadly based difficulties in social, interpersonal, and occupational functions that last at least into early adulthood.

Implications

There are several implications of the results of this study. Knowledge of the psychological responses after a pregnancy termination may enable health personnel to distinguish better those women who need extra help and follow-up. It may also help women who have a miscarriage or an induced abortion to avoid being taken by surprise or to have negative feelings about their own responses.

CONCLUSION

Our finding of the apparent enduring avoidance of the induced abortion experience calls for future studies in this field. The avoidance may represent shame over the abortion procedure and over being in the situation of having an unwanted pregnancy. It may also indicate a greater long-term emotional disturbance than what has been described in the literature so far.

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