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Depression associated with abortion and childbirth: a long-term analysis of the NLSY cohort

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- A** Study Design
- B** Data Collection
- C** Statistical Analysis
- D** Data Interpretation
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Summary

Background:

Existing research pertaining to emotional reactions to abortion is limited by (a) short follow up periods, (b) the absence of information on prior psychological state, and (c) lack of nationally representative samples. Therefore the purpose of this study was to compare women with a history of abortion vs. delivery relative to depression using a nationally representative longitudinal design, which enabled inclusion of a control for prior psychological state.

Material/Methods:

The current study employed data for all women from the National Longitudinal Survey of Youth (NLSY) who experienced their first pregnancy event (abortion or childbirth) between 1980 and 1992 (n=1,884). Depression scores in 1992, an average of 8 years after the subjects' first pregnancy events, were compared after controlling for age, race, marital status, divorce history, education, income, and external locus of control scores. The latter was used to control for pre-pregnancy psychological state. Results were also examined separately for groups based on race, marital status, and divorce history.

Results:

After controlling for several socio-demographic factors, women whose first pregnancies ended in abortion were 65% more likely to score in the 'high-risk' range for clinical depression than women whose first pregnancies resulted in a birth. Differences were greatest among the demographic groups most likely to report an abortion.

Conclusion:

Abortion may be a risk factor for subsequent depression in the period of 8 years after the pregnancy event. The higher rates of depression identified may be due to delayed reactions, persistence of depression, or some other common risk factor.

key words:

induced abortion • childbirth • depression

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BACKGROUND

Research on emotional adjustments following induced abortion suggests that although women generally perceive abortion as a stressful event, the majority of women do not suffer from severe negative reactions soon after the procedure [1–2]. Unfortunately, most of these studies have employed only short-term follow-up interviews of women who had abortions at a small number of abortion clinics. Data on post-abortion reactions has typically been collected within hours or weeks of the event. Assessments extending beyond six months are uncommon.

Recent research, however, indicates that women undergoing an abortion may experience delayed reactions long after the period of time usually studied. Miller, Pasta and Dean conducted a longitudinal investigation with women involved in clinical trials of the abortifacient, RU-486 [3]. Women in this study were interviewed prior to the abortion, 2 weeks later, and then 6–8 months after the abortion. They found that regret increased from 2 weeks to 6–8 months post-abortion. In regard to delayed reactions, Miller and his colleagues concluded that 'there is very likely a time course associated with the coping process that follows abortion and this time course almost certainly does not show a straight line of improvement. In other words, the low point following the abortion may not occur for days, weeks, or even months' (p. 262). Miller had found similar results indicating the presence of delayed reactions in a prior study covering three years [4].

Most recently, Major and colleagues analyzed the psychological state of women one hour pre-abortion, and one hour, one month, and two years post-abortion [5]. They found an increase in negative emotions and a decrease in relief and positive emotions between the assessments at one hour post-abortion and two years post-abortion. The results also revealed an increase in depression and a decrease in satisfaction with the abortion decision over time. The proportion of women reporting satisfaction with their abortion decision after one month dropped by 6.7% when asked about decision satisfaction after two years. The difficulty in obtaining a gauge of the exact prevalence of delayed reactions was complicated by the fact that 50% of their original sample were lost to attrition by the time that the two year follow-up had taken place. Even though Major and her colleagues did not detect significant demographic differences between the final sample and the attrition sample, previous research has found that those lost to sample attrition are generally more vulnerable to negative post-abortion reactions [6–7].

One longitudinal study that has been employed to study the aftereffects of abortion is the National Longitudinal Survey of Youth (NLSY). This interview-based cohort study began in 1979 and has continued to the present. Men and women aged 14–21 at the time of the 1979 interview have annually answered questions relating to employment, education, marital status, and reproductive history. The primary purpose of the NLSY is the

study of labor practices, but variables associated with different social science fields have also been included at various years.

As a tool for studying abortion, the NLSY data set, like all surveys that inquire about abortion history, is plagued with a high rate of underreporting. Analysis of the abortion rate reported by the NLSY cohort compared to the national statistics compiled by the Alan Guttmacher Institute has shown that women in the NLSY report approximately 40% of the abortions that would be expected [8]. Discrepant concealment rates have been noted based on demographic variables. Jones and Forrest reported that married women were over twice as likely to report an abortion as unmarried women (74% vs. 30%) [8]. In addition, White (non-Black and non-Hispanic) women (45%) were much more likely to report an abortion than Blacks (27%) or Hispanics (19%). Post-abortion research has revealed that women who conceal their abortion experience from others are more likely to suppress thoughts of the abortion, experience more intrusive abortion-related thoughts, and feel greater psychological distress [9]. This suggests that the women who admitted having a past abortion in the NLSY study may have been less likely to experience psychological distress than those who concealed their abortions.

Two previous post-abortion psychological studies carried out using the NLSY data set were conducted by Russo and Zierk and Russo and Dabul [10–11]. These researchers analyzed the ten-item Rosenberg Self-Esteem Scale [12], which was included in the 1980 and 1987 NLSY interviews, and found comparable self-esteem scores between aborting and non-aborting women. From this finding the authors drew the broad conclusion that abortion has no independent effect on women's general well-being. This conclusion is not supported, however, by the results of the study by Miller et al, which revealed that the Rosenberg Self-Esteem scale may not be a sensitive measure of post-abortion adjustment [3]. Their study suggested that self-esteem scores remained virtually unchanged at three different time points while other emotional states varied significantly. Major and colleagues found that post-abortive women's self-esteem scores increased over time although negative reactions also increased [5]. These results suggest that self-esteem may be a trait among aborting women that is less sensitive to environmental stressors, with questionnaires assessing depression or anxiety representing better indicators of post-abortion adjustment.

Fortunately, self-esteem is not the only measure available to researchers for the assessment of psychological well-being in the NLSY data set. In 1979, respondents were presented with an abbreviated version of the Rotter Internal-External Locus of Control Scale.

Suitability of the Rotter scale as a marker for depression is confirmed by previous investigations demonstrating an association between external locus of control and greater depression [13–17]. Moreover, theoretical work pertaining to the etiology of depression has postulated

a causal link between feelings of lack of control and the development of depression [18]. In addition, a short, preliminary analysis of CES depression scores revealed that women who aborted a first pregnancy were at significantly higher risk of depression compared to similar women who carried an unintended first pregnancy to term [19,20]. Two additional items relating to psychological disturbance were included in the survey in 1998: a question regarding any past diagnoses of mental problems and a self-assessment of current 'depression, excessive worry, or nervous trouble of any kind.

Since the previous and widely cited analyses of NLSY data were limited only to an examination of self-esteem scores [10-11], the objective of this study was to more completely examine this study population with an analysis of the depression scores and responses to the two psychological disturbance items, that are also available in the data set, in regard to a history of delivery versus abortion controls instituted for age, race, marital status, divorce history, education, family income, and external locus of control scores. Based on Jones and Forrest's [8] work indicating that the rate of concealment of past abortions was highest among non-White women and unmarried women, another goal was to examine differences relative to race, marital status, and divorce history

MATERIAL AND METHODS

Subjects

This analysis is based on data collected through 1992 from the National Longitudinal Survey of Youth (NLSY), a survey conducted by the Center for Human Resource Research at Ohio State University and funded by the United States Department of Labor. Although its primary purpose is the study of U.S. labor practices, a considerable amount of data of potential interest to other fields of inquiry were also collected. The survey began in 1979 and involved the follow-up of 12,686 youths aged 14–21 at the time of the first interview. The nationwide sample used for this study had an over-sampling of Blacks (25.0%), Hispanics (15.8%), and poor Whites (20.7%). A routine set of questions are asked in each annual survey, and items pertaining to specific subject interests, which vary from year to year, are also included.

Since the 1979 Rotter scale assessment was used as a marker of emotional state prior to the first pregnancy outcome, the sample of women used in these analyses includes only women who met two criteria: 1) first abortion or first delivery was between 1980 and 1992, and 2) both the 1979 Rotter scale and the 1992 CES-D scale (n=1,884) were completed.

The average age of post-abortive women in 1992 was 29.82 (SD=2.1; n=293); among non-abortive mothers, the average age was 30.30 (SD=2.2; n=1, 591). Among all women with a history of abortion, 23.2% were Hispanic, 24.2% were Black, and 52.6% were non-Black and non-Hispanic. Among all women with a history of

childbirth, 20.7% were Hispanic, 24.1% were Black, and 55.1% were non-Black and non-Hispanic. The average number of children among the childbirth group in 1992 was 1.90 (SD=0.9); whereas the average number of children among the abortion group in 1992 was 1.32 (SD=1.2). With regard to income, the average for the women with a history of childbirth was \$33,969 (SD=\$21,645) and the average for the women with a history of abortion was \$33,554 (SD=\$22,405). Finally, the average number of years of formal education among the women with a history of childbirth was 12.96 (SD=2.13); whereas the women with a history of abortion reported an average of 13.37 (SD=2.28) years of formal education. Since women reported the year of their abortions or deliveries, rather than age, we calculated the average year of their first pregnancy events. Among women who had abortions, the average year of their first abortion was 1985 (SD=3.5). Among women who did not report any abortions, the average year of their first childbirth was 1985 (SD=3.4).

Variables used for analysis

Women were queried regarding their childbirth history every year beginning in 1979. Starting in 1984, women were asked about their abortion history every two years by way of a confidential abortion card. This self-report card was used to more accurately obtain this sensitive information. The first childbirths recorded for the sample occurred in 1970; the first abortion occurred in 1971. All variables regarding abortion and childbirth outcomes were used to construct a reproductive history profile for each woman. The two groups include women whose first reproductive event was either an abortion or a birth (with no subsequent abortions).

The Rotter Internal-External Locus of Control Scale was included in the NLSY 1979 interview in the form of a four-item abbreviated version of the more widely known scale [21]. This scale is intended to measure the extent to which one feels in control of one's own destiny versus the extent to which one believes one's fate is decided by environmental or chance circumstances. On this abbreviated scale, higher internal control is associated with higher self-esteem, social class, and education [22]. As noted earlier, studies using extended versions of the Rotter scale have revealed correlations between external scores and higher depression scores [13–17]. The four items included on the scale used for the present analysis are the following: 1) 'What happens to me is my own doing' vs. 'Sometimes I feel that I don't have enough control over the direction my life is taking', 2) 'When I make plans, I am almost certain that I can make them work' vs. 'It is not always wise to plan too far ahead, because many things turn out to be a matter of good or bad fortune anyhow', 3) 'In my case, getting what I want has little or nothing to do with luck' vs 'Many times we might just as well decide what to do by flipping a coin', and 4) 'Many times I feel that I have little influence over the things that happen to me' vs 'It is impossible for me to believe that chance or luck plays an important role in my life.' For each question, respondents are asked to report how close the statement is to

their own opinion. Internal statements are scored '1' for 'much closer' and '2' for 'slightly closer.' External statements are scored '3' for 'slightly closer' and '4' for 'much closer'. Overall scores range from 4 to 16. Higher scores indicate a more 'externally controlled' individual, and lower scores indicate a more 'internally controlled' individual.

The Center for Epidemiological Studies Depression scale [23] contains 20 items relating to depressive symptoms and was given to women in 1992. This scale is widely-used and has correlated well with other measures of depression [23,24]. Studies have demonstrated good test-retest reliability of the CES-D among diverse population subgroups [25–28]. In addition, the CES-D has been found to discriminate fairly well between individuals who are participating in clinical treatment for depression and those who are not [23,24]. However, researchers have cautioned the use of the CES-D in obtaining a firm clinical diagnosis of depression [29]. Breslau found the CES-D to predict generalized anxiety just as well as it predicts major depression [30]. Therefore, it's proper use may be as a general indicator for psychological distress. The CES-D may be self- or interviewer-administered; the National Longitudinal Survey used professional interviewers to score the CES-D scale. Respondents were asked to rate on a 4-point scale how often they had been experiencing a certain sensation during the past week, 0 being 'Rarely or None of the Time/1 Day' and 3 being '3=Most or All of the Time/5–7 Days.' Possible scores range from 0 to 60, with higher scores indicating greater depression. The average score for a normal population is 9.25, and the standard cut-off score of 16 has usually been used to distinguish clinically depressed individuals from those classified as non-depressed [31].

In 1998 two items relating to mental health were presented to a subset of the NLSY cohort. The first of these items asked the interviewees 'Has a doctor ever told you that you had emotional, nervous, or psychiatric problems?' The second asked if the respondent were currently experiencing 'depression or excessive worry or nervous trouble of any kind.' Analyses of these variables were included in the present paper to provide additional indicators of psychological well-being. However, only 202 women in the sample groups completed these items, reducing the power of the statistical tests incorporating them.

In order to control for the effects that socio-marital support may have on depression, variables were extracted from 1992 pertaining to marital history: what years they began/ended their first marriage, what years they began/ended their second marriage, and what year they began their third marriage. The data set does not show information beyond the third marriage. Women for this study were categorized according to whether they were a) in their first or second marriage, or if they were b) never-married or had not remarried after their first or second divorce. Women who had been married three times were excluded from marital analyses since it was not possible to determine if they were still married.

Divorce history (1st marriage did or did not end in divorce) data were also extracted from 1992.

Finally, a variable pertaining to total family income was extracted for 1992. Race and age data for women at the time of the first interview in 1979 were also extracted and used for these analyses. Only three races are identified in NLSY: Black, Hispanic, and non-Black and non-Hispanic. For convenience, the latter is generally identified as White in most NLSY-based studies, and this terminology will be used in this paper. In actuality, White in this and other NLSY studies includes Native Americans, Asians, Pacific Islanders, and other non-Black and non-Hispanic racial minorities.

RESULTS

Prior to running logistic regressions designed to compare depression rates among women whose first pregnancy ended in either an abortion or a birth, zero-order correlational tests were conducted between depression scores and various socio-demographic variables as well as locus of control scores using data derived from the full sample. The results of these tests are provided in Table 1 and the data pertaining to significant associations were used to select covariates (age, race, education, income, marital status, locus of control scores, and history of divorce).

In order to determine whether or not a history of abortion was related to a higher probability of experiencing scores considered at high risk for clinically significant levels of depression (scores of 16 or higher on the CES-D) (Table 2), a logistic regression analysis was conducted with controls instituted for age, race, education, income, marital status, history of divorce, and locus of control scores. The result of the analysis was significant with an odds ratio of 1.65 ($p=0.011$; CI: 1.12–2.43) indicating that a prior history of abortion was associated with greater risk of depression. The percentage of women with CES-D scores above 16 in the abortion and delivery groups were 27.3% and 21.4% respectively.

Table 1. Full sample zero-order correlational analyses between participant characteristics and total depression (CES-D) scores.

Characteristic	CES-D scores
Age	-0.05*
Income	-0.27***
Years of formal education	0.18***
Number of children	0.04
Marital status	-0.20***
Divorce history	0.21***
Race	0.14***
Locus of control	0.16***

* $p<0.05$;

** $p<0.01$;

*** $p<0.001$

Table 2. Results of logistic regression analyses conducted separately based on demographic characteristics with reproductive history as the predictor and 'high risk' scores on the CES-D as the criterion in each analysis.

	Frequency and % of abortion group with scores at or above 16 on the CES-D	Frequency and % of birth group with scores at or above 16 on the CES-D	Adjusted Odds-Ratios (95% CI) using the birth group as the reference group	
Race				
White	37/154 or 24.0%	152/877 or 17.3%	OR=1.79 (1.04 to 3.07),	p=0.034*
Black and Hispanic	—	—	OR=1.49 (0.85 to 2.62),	p=0.168*
Marital status				
Married	43/164 or 26.2%	204/1197 or 17.0%	OR=2.16 (1.40 to 3.36),	p=0.001**
Not married	—	—	OR=0.88 (0.56 to 1.39),	p=0.581**
History of divorce				
1 st marriage ended in divorce	—	—	OR=0.63 (.28 to 1.38),	p=0.246***
1 st marriage did not end in divorce	35/131 or 26.7%	162/1026 or 15.8%	OR=2.19 (1.41 to 3.41),	p=0.0001***

* Covariates included marital status, history of divorce, age, 1992 income, number of years of formal education, and 1979 Rotter Locus of Control scores;

** Covariates included race, history of divorce, age, 1992 income, number of years of formal education, and 1979 Rotter Locus of Control scores;

***Covariates included for race, marital status, age, 1992 income, number of years of formal education, and 1979 Rotter Locus of Control scores

Principle components factor analysis with varimax rotation was conducted using the 20 items composing the CES-D scale and the results of the analysis revealed the presence of 3 factors with eigenvalues over 1.00 and explaining 25%, 13.7%, and 8.7% of the variance respectively. Examination of the content of the 15 items, which loaded on Factor 1 with positive correlations above 0.35 suggested that this factor could be conceptualized as a *Sadness* factor. The items that loaded highly (all in a positive direction) on this factor dealt with various subjective negative personal experiences associated with depression. Factor 2 was interpreted to represent an *Enjoyment* factor as it contained 4 items that were negatively correlated above 0.68 with content pertaining to happiness, feeling good, and hope. Finally, the third factor only contained 2 items; however the positive correlations were in excess of 0.74. The content of the items loading on Factor 3 dealt with *Negative Relationships* (feeling disliked by others and feeling as if others were unfriendly). Items loading on the 3 factors were combined to form three subscales to enable comparisons between the abortion and delivery groups, which might reveal the more specified aspects of depressive symptomatology likely to be associated with an abortion experience. The potential range of scores on the three subscales was from 0 to 42, 0 to 12, and 0 to 6 respectively. A multivariate analysis of covariance was conducted to compare the abortion and delivery groups relative to the *Sadness*, *Enjoyment* and *Negative Relationships* factors using age, race, education, income, marital status, history of divorce, and locus of control scores as covariates. The overall analysis using Hotelling's Trace statistic as the omnibus F test was significant, $F(3,1367) = 4.29, p < 0.005$. Further, significant differences were detected based on reproductive history relative to the *Sadness* ($F(1,1369) = 5.59, p = 0.018$) and the *Negative Relationships* ($F(1,1369) = 10.90, p < 0.001$) subscales. On the *Sadness* subscale, women with a history of abortion had higher scores ($M = 8.04, SE = 0.51$) than women with a history of delivery ($M = 6.75, SE = 0.19$). Women in the abortion group

were also more likely to report negative relationships ($M = 0.66, SD = 0.07$) when compared to the delivery group ($M = 0.41, SE = 0.03$). No significant difference was detected based on reproductive history relative to the *Enjoyment* subscale ($F(1,1369) = 1.03, p > 0.05$).

Because one of the items on the CES-D scale was conceptually similar to self-esteem in that the respondents were asked to indicate the extent to which they felt 'as good as other people', an analysis of covariance was conducted to examine the extent to which abortion experience was linked to this brief indicator of self-esteem after controlling for age, race, education, income, marital status, history of divorce, and locus of control scores. The result was not significant ($F(1,1369) = 1.86, p = 0.173$).

Analysis of the two variables related to mental health collected in 1998 was complicated by the fact that these two questions were presented to only a small sample of the entire cohort. Among women who had their first childbirth or abortion between 1980 and 1998, only 177 of the childbirth group and 25 of the abortion group completed the two items relating to psychiatric disturbance. To examine the data, two separate logistic regression analyses were conducted after controlling for age, race, education, income, marital status, history of divorce, and locus of control scores. In regard to the first question, 'Has a doctor ever told you that you had emotional, nervous, or psychiatric problems?' 6.2% of the childbirth group answered in the affirmative to this question compared to 8.0% of the abortion group. However the group difference was not significant ($OR = 1.52, 95\% CI: 0.14$ to $15.9, p > 0.05$). For the second question, pertaining to whether the women were currently experiencing 'depression or excessive worry or nervous trouble of any kind' 13.6% of the childbirth group answered in the affirmative to this item compared to 28.0% of the women in the post-abortion group. This difference was stronger, but did not reach significance ($OR = 2.51, 95\% CI: 0.53$ to $12.01, p > 0.05$).

DISCUSSION

The present study revealed that women with a prior history of abortion were 65% more likely to score in the 'high-risk' range for depression after controlling age, race, education, income, marital status, and history of divorce. In addition, an abbreviated version of the Rotter Internal-External Locus of Control scale [12] was used in order to control for psychological state prior to abortion or childbirth. In this study, as in others, there was a significant correlation between external locus of control and depression scores in general. The higher rates of depression identified years after the pregnancy may be due to persistence of depression associated with abortion, a delayed reaction which may be precipitated by subsequent events, such as a later pregnancy, or by some other unknown common risk factor.

Since depression is a risk factor for suicide, our primary finding of higher depression rates among post-abortive women in the NLSY cohort is consistent with studies linking abortion to an increased risk of suicide [32–36]. In the largest record based study of suicide subsequent to pregnancy outcome, the age-adjusted odds ratio of dying from suicide in the year following an induced abortion was 6.46 compared to women who delivered and 3.68 compared to women who had not been pregnant in the prior year [36]. These findings suggest that childbirth may have a protective effect against suicide while abortion may have a deleterious effect. If aborting women experience a different type of depression than childbearing women, it may be possible that this type of depression is more closely correlated to suicidal ideation. Further exploration of the relationships among depression, suicide, abortion, and childbirth would be beneficial.

One of the weaknesses of this study is the high rate of concealment of past abortions among NLSY women. Jones and Forrest's analysis of the NLSY data found that the overall concealment rate was approximately 60%, with unmarried women and minorities more likely to conceal past abortions [8]. To examine the impact of concealment on our findings, we conducted additional separate analyses based on marital status and race. The odds ratios for 'at risk' depression scores were highest within those groups who were most likely to report an abortion (married and White). Conversely, among the groups with the highest concealment rate (all unmarried and all Blacks and Hispanics) significant differences were lost. One possible explanation for these findings is that, among groups which have the highest concealment rate, women who admit to an abortion are less likely to experience depression than their counterparts who conceal their abortions. This explanation is supported by the finding of Major and Gramzow that women who conceal their abortion are more likely to suppress thoughts of the abortion and feel greater psychological distress [9]. Another possibility is simply that concealment introduces the misclassification of aborting women as non-aborting women with high depression scores.

In the comparison of the one individual CES-D item with conceptual congruence with self-esteem, feeling

'just as good as other people' no difference was detected between the women with a history of abortion vs. birth. The absence of any significant difference between groups on this item is consistent with prior research of post-abortion reactions showing little effect of abortion on self-esteem [3,5,10,11].

The finding of greater depression without a loss of self-esteem may be evidence of the complex nature of post-abortion emotional responses. A certain quality of depression that is independent of self-esteem is found in grief reactions [37]. Also, accumulating research suggests that positive and negative well-being are two distinct concepts [38–41]. Assessments of positive well-being such as the Rosenberg self-esteem scale have items which appear to relate more to personality than emotional state. Measures of negative affect, such as the CES Depression scale, include questions relating to specific emotional states and behaviors that may vary a great deal at different points in time. Researchers conducting studies designed to examine the effects of abortion should carefully attend to the selection of measures to ensure that instruments used to capture reactive emotional experiences are sufficiently sensitive. If the goal is to tap into positive emotions after an abortion, then researchers should use assessments that tie reactive emotions directly to the abortion event. For example, one might ask the respondent if she has experienced increased levels of happiness or contentment since the time of the abortion.

A primary strength of the present study is that we were able to examine psychological state many years after the target pregnancy events. Since the average year women obtained their first abortion was 1984, this study provides insight into the association between abortion and depression approximately eight years after the abortion.

The present study was limited in that the full psychiatric history of aborting and child-bearing women is unknown. The NLSY did not include the same assessments every year of the study. If a questionnaire measuring depression had been given to women during each year of the survey, more support for a cause and effect relationship between pregnancy outcome and mental health might have been obtained. Nevertheless, this data set enabled control for factors other than abortion or childbirth that could contribute to poor mental health, such as marital status, divorce history, socio-economic status, and locus of control scores prior to the abortion and childbirth events.

CONCLUSIONS

At an average of eight years after their first pregnancy, women who aborted their first pregnancy have significantly higher likelihood of being at risk for clinical depression than childbearing women who do not report a history of abortion. This finding may be explained by preexisting differences related to personality or mental health between women most likely to choose abortion and those who are not inclined to opt for the procedure. The alternative explanation that there is a causal

relationship between abortion and subsequent depression is strengthened, however, by our ability to control the results using a pre-pregnancy assessment of locus of control.

In his recommendation for a longitudinal study to investigate psychological reactions to abortion, Surgeon General C. Everett Koop raised the concern that 50% or more of women who have had an abortion will conceal it from interviewers [42]. Despite the same problem in this study, in which only 40% of the expected number of abortions were revealed, significant differences still emerged. This suggests that concealment, while a problem, may not pose an insurmountable obstacle if the effects measured are strong enough to overcome the diluting effects of concealment. In addition, our analysis of the reporting patterns in the NLSY data suggest that women who deny abortions at one point in time may admit to them during some prior or subsequent interview. In a longitudinal study, where women are asked to recount their complete reproductive history every year, it may be possible to fill in significant gaps. Another way to help mitigate this problem might be to periodically request the study participants' permission to obtain and review their medical records. A third approach might entail the employment of trained counselors who would undertake periodic psychological evaluations of a small sample of the study cohort. After establishing an appropriate level of trust, a review of the woman's history of pregnancy losses may correct omissions from prior surveys. This approach would also provide a means for a more in depth look at women's mental health relative to reproductive health. Research suggests that, compared to studies utilizing questionnaires, interview-based studies are much better indicators of the extent and severity of post-abortion grief [43].

We recommend a major longitudinal cohort study to examine the interactions between obstetric history and emotional well-being. This would enable researchers to gauge the interactions among mental health and childbirth, parenting, adoption, abortion and miscarriage. In addition, the effects of marriage, divorce, single parenting, multiple partners, domestic violence, PMS and menstrual irregularities, contraceptive practices, and other confounding factors related to reproductive and mental health could also be investigated. This type of research would go beyond the scope of the study proposed by Koop [42] but would serve to better illuminate a wide variety of psychological, medical, and social issues that are uniquely related to women.

Prior studies of post-abortion sequelae that claim to have controlled for pre-existing psychological problems have used relatively weak methodology. For example, Major et al. asked women one hour before their abortion whether they had felt certain symptoms of depression during the past month, and their responses to these questions were taken to be an indicator of a prior history of depression. [5] However, emotional disturbance in the month prior to the abortion may suggest ambivalence and distress regarding the decision to abort. In addition, research has found that depressed

mood makes one less likely to recall positive experiences and more likely to recall negative experiences [44]. This phenomenon is of particular importance given the distress that many women feel at the time of the abortion. In light of these confounding factors, history of depression and psychological dysfunction among aborting women should be assessed prior to the conception date.

The findings of the present study suggest that future research efforts should be directed toward the examination of long-term post-abortion reactions. As previously noted, other researchers have likewise expressed a need for more extensive, long-term investigations [3]. Such research efforts would be beneficial in attempts to understand why abortion, or the circumstances surrounding abortion, may be problematic for some women. A greater knowledge of various abortion-related stressors would be helpful in pre- and post-abortion counseling.

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