



Miscarriage and mental health: Results of two population-based studies

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ABSTRACT

A miscarriage may have a sustained negative effect on mental health. Our aim was to analyze the association of the history and, if any, the number of miscarriages with mental health. The participants were women from two population-based studies, the Finnish Health 2000 survey and the National FINRISK 2002 Survey. Data were collected with a set of self-reported questionnaires, a clinical health examination and/or a home interview. A modified Beck Depression Inventory (BDI), the 12-item General Health Questionnaire (GHQ-12), the Munich-Composite International Diagnostic Interview (M-CIDI) and other non-structured interviews were used for the assessment of mental health. A diagnosis of depressive disorder and the presence of depressive symptoms were more prevalent among women with a history of miscarriage. In both datasets the higher the number of miscarriages was, the worse the current state of mood was and the higher the frequency of a psychiatric diagnosis was. These results suggest that a miscarriage, and in particular the number of miscarriages, contributes to mental health in a negative way for long.

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1. Introduction

Miscarriage is a common complication of pregnancy that may cause the woman a significant physical as well as psychological distress. Indeed, as it is the case for any other experience of loss, it may be followed by a grief reaction resembling the one occurring after the death of a loved one (Brier, 2008; Adolfsson and Larsson, 2010; Kersting and Wagner, 2012). In addition, the aftermath of a miscarriage has some unique characteristics, since there are no tangible memories of the loved one, rather his/her image relies mostly on mother's mental representation and dreams (Brier, 2008).

Beutel et al. (1995) distinguished between a grief reaction, a depressive reaction, and a combined depressive–grief reaction (and no reaction at all) in women following a miscarriage. Their findings suggest that the normal grief that may follow a miscarriage is mostly comparable to the usual uncomplicated grief, characterized initially by shock and disbelief, and subsequently by sadness, guilt, shame, helplessness and hopelessness, and possibly associated with somatic symptoms. Normally, a gradual grief attenuation occurs with time (Shear et al., 2011), even though in a few cases the symptoms persist for more than 6 months, leading to a “complicated grief” (Germain et al., 2005; Monk et al., 2006), which is usually accompanied by a depressive

reaction and may finally lead to psychiatric complications (e.g. posttraumatic stress disorder (PTSD), anxiety disorders, major depressive disorder (MDD) (Horowitz et al., 1997; Bonanno and Kaltman, 2001) and suicidality (Szanto et al., 2006)).

Similarly, Beutel et al. (1995) reported that the majority of the symptoms detected in the short time following a miscarriage gradually attenuated at 6- and 12-month follow-ups (even though remaining more severe than in the general population). Also, their results suggested that women undergoing a pure grief reaction were not in need of any psychotherapeutic help, while women developing a depressive (or grief-depressive) reaction might be in need of specific care, being at risk of a long-term depressive status.

Some recent longitudinal studies (Lok et al., 2010; Sham et al., 2010) provided further evidence for relatively low psychological well-being and high levels of psychopathology (new onset or recurrent psychiatric, especially depressive, disorders or symptoms) in the short term after a miscarriage. Moreover, young women experiencing a pregnancy loss, be it miscarriage or induced abortion, seem to have an increased risk of lifetime alcohol and substance use disorders and a higher risk of affective disorders when compared to women who had a live birth (Dingle et al., 2008). Additionally, miscarriage has been found to be associated with recurrent obsessive–compulsive disorder (Geller et al., 2001) and with PTSD symptoms (Engelhard et al., 2001).

Even though in general it seems that the psychological distress following a miscarriage is mostly self-limiting and subsides with

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time (Nikcevic et al., 1999; Broen et al., 2005; Brier, 2008), studies are quite consistent in claiming that a few symptoms can still be found after one year (Cumming et al., 2007; Lok et al., 2010), and it is not possible to rule out that a subset of vulnerable women will develop some long-lasting consequences, especially as regards the mood dimension. Indeed, Lok et al. (2010) have detected a group of initially more distressed women that had persisting above-the-cut-off scores, even at one year post-miscarriage.

The question whether a history of previous miscarriages may contribute to the depressive or anxious aftermath of a further miscarriage is still open. Some authors (Klier et al., 2000; Adolfsson and Larsson, 2010; Sham et al., 2010) have found no increased risk of depressive reaction or other psychiatric symptoms in the case of a further miscarriage, and women presenting with high vs. low General Health Questionnaire- (GHQ) and Beck Depression Inventory- (BDI) scores after a miscarriage do not differ in terms of their obstetric history (i.e. previous miscarriages, previous induced abortions, history of infertility and planned pregnancy) (Lok et al., 2010). On the contrary, some old studies (Friedman and Gath, 1989; Thapar and Thapar, 1992; Janssen et al., 1996) have shown more depressiveness and/or anxiety in women with a history of previous miscarriages. Additionally, women with a history of recurrent pregnancy losses have poorer quality of life and more depressive and anxiety symptoms during a subsequent pregnancy than pregnant women with no history of pregnancy loss (Couto et al., 2009).

Given these inconsistencies, the aim of our study is to explore the associations between a history of miscarriage and the current psychological well being and psychopathology on two large nation-wide samples of adult women. On the basis of the main findings from the literature, we hypothesize that, at least in a subset of women, an association between history of miscarriage and current mood/anxiety symptoms will be found. Furthermore, we aimed to study any possible association between number of miscarriages and mental health of women. We would hypothesize that the higher the number of miscarriages, the worse the psychological status at the current examination.

2. Methods

The data analyzed were collected in the context of two studies carried out in Finland: the Health 2000 Survey and the National FINRISK Survey 2002.

2.1. Health 2000

Health 2000 is a cross-sectional, nation-wide, survey carried out in Finland in 2000–2001 (www.terveys2000.fi). The stratified and clustered sampling procedure allowed us to obtain a representative sample ($n=8028$; final sample $n=6986$; $M=3126$, $F=3860$) of the general population aged 30 years and older. More details about the study design and methodology have been described elsewhere (Heistaro, 2008; Supplementary Table). Data collection consisted of a home interview followed by a clinical health examination; a total of four self-administered questionnaires were given to be filled and returned. A modified version for the Finnish population of the Beck Depression Inventory (BDI) (Raitasalo, 1995) and the General Health Questionnaire-12 (GHQ-12) were included in one of the self-administered questionnaires. In connection with the health examination the Composite International Diagnostic Interview (CIDI) (WHO CIDI, 1990), a structured mental health interview, was carried out to assess mental health in the previous 12 months.

Approval for the survey was obtained from the National Public Health Institute's Ethics Committee (1999) and from the Ethics Committee for Research in Epidemiology and Public Health at the Hospital District of Helsinki and Uusimaa (2000). Written informed consent was obtained from all participants.

2.1.1. Reproductive health

Information about reproductive health features was obtained through a non-structured, lay-administered interview. The questions included information on menstrual features (age of menarche; menstrual flow regularity—"Do you have

periods nowadays: regularly; irregularly; none?"; menopausal age and causes—"Did your periods end: naturally with the menopause; after an operation or radiotherapy; for some other reasons?"), pregnancies (number of pregnancies; number of live births; history and number of induced abortions and miscarriages), infertility, past and current use (or not) of contraception and hormonal replacement therapy, and length of its use. The pregnancy-related variables were assessed via the following questions: "How many pregnancies have you had?" and "How many miscarriages -defined in Finland as a fetal death before 22+0 weeks of pregnancy- have you had?". Number of live births was gained asking "How many births have you had?" and "How many (children that you have delivered) were born alive?". Lifetime experience of infertility was assessed via the question "Have you had such time periods, when you have tried to get a child, but have not succeeded or to succeed has taken over 12 months?".

Women's reproductive status was classified as postmenopausal if time from the last period was 12 or more months; perimenopausal, if it was between 6 and 12 months or if the woman was using hormone replacement therapy (and the periods have not ended before starting hormone replacement therapy); and premenopausal, if the time since last period was less than 6 months.

2.1.2. Mental health

Psychological well-being was assessed by using the 12-item GHQ, a broadly used questionnaire introduced by Goldberg (1972) to evaluate the common mental state, with particular attention to the areas of depression and anxiety. The GHQ gives a view of the recent general mental health (in the past four weeks). The presence and severity of depressive symptoms in the previous two weeks were assessed via a modified version of the 21-item BDI (Raitasalo, 1995), a reliable and commonly used self-reported inventory validated by Beck et al., (1961) to assess depression, inquiring specifically into depressive, cognitive and somatic symptoms.

At the end of the health examination, a structured diagnostic interview (CIDI) based on the DSM-IV diagnostic criteria and developed by the World Health Organization was carried out; the Munich computerized version of the CIDI was used (Wittchen et al., 1998). The CIDI interview was administered by trained interviewers, allowing them to assess the presence, onset and recency of psychiatric disorder in the 12 months prior to the interview. For the purpose of this study we focused on alcohol abuse and dependence, major depressive episode (MDE), major depressive disorder (MDD), dysthymic disorder, any anxiety disorder (i.e. panic disorder with or without agoraphobia, social phobia, phobic disorder not-otherwise-specified and/or generalized anxiety disorder). "Any current psychiatric diagnosis" was defined as meeting the criteria for at least one full diagnosis in the last 12 months (excluding cases with missing data at one or more of the diagnoses inquired about).

BDI and GHQ total scores were considered only for the cases with at least 16 and 10 valid answers, respectively; each BDI- and GHQ-item score was calculated for all the participants with a valid answer for that item.

2.2. National FINRISK survey

The National FINRISK Survey is a cross-sectional population survey carried out in Finland every five years since 1972. Since more detailed information relative to reproductive health, including history of miscarriage, was provided by the FINRISK 2002 survey, only data collected in 2002 were considered for the purpose of this study. Data were collected on an independent, random population sample aged 25–64 years from six different parts of Finland. Data for women aged 65–74 years are also available for three regions (the cities of Helsinki and Vantaa and the Lapland province). More details about the study design and methodology have been described elsewhere (www.ktl.fi/finriski; Supplementary Table). The survey was carried out through a non-structured, self-administered questionnaire and a health examination. Women participating in the survey were also asked to fill in a separate questionnaire concerning reproductive health. The FINRISK survey was conducted according to the ethical rules of the National Public Health Institute and the Declaration of Helsinki. Ethics approval has been received from the coordinating Ethics Committee of the Helsinki University Hospital District. Written informed consent was obtained from all participants.

2.2.1. Reproductive health

The questions concerning reproductive health were similar to those described for the Health 2000 and regarded menstrual features (age of menarche; menstrual flow regularity—"Have you ever had irregular menstruations?" and "Do you at the moment experience the need to find help for irregular menstruations?"; menopausal age; causes for menopause—"If your menstruation has ended, did it end: naturally to the menopause; because of hysterectomy; because the uterus and both ovaries were removed; because of radiotherapy or other reasons?"), pregnancies (number of pregnancies, number of births, history and number of induced abortions, and history and number of miscarriages), infertility, past and current use (or not) of contraception and hormonal replacement therapy, and length of its use. The pregnancy-related variables were assessed via the question: "How many times have you been pregnant (include miscarriages, abortions and extra-uterine pregnancies)?". History and number of miscarriage was inquired consistently with

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