



Original article

Depressive symptoms in mothers after perinatal and early infant loss in rural Bangladesh: a population-based study



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ABSTRACT

Purpose: We examined stillbirth and neonatal death as predictors of depressive symptoms in women experiencing these events during the first 6 months postpartum.

Methods: We performed secondary analyses using data from 41,348 married women aged 13–44 years, originally collected for the JiVitA-1 study (2001–2007) in northwest Bangladesh. Adjusted relative risk ratios were estimated to determine the associations between stillbirth and early infant death and women's risk of reported depressive symptoms (trichotomized 0, 1–2, 3–5) up to 6 months after the death. Adjusted risk ratios, comparing 0–2 versus 3–5 depressive symptoms, were used in stratified analyses.

Results: Women having fetal/infant deaths had elevated risk of experiencing 1–2 postpartum depressive symptoms (adj RRRs between 1.2 and 1.7) and of experiencing 3–5 postpartum depressive symptoms (adj RRRs between 1.9 and 3.3), relative to women without a fetal/infant death. Notably, those whose infants died in the early postneonatal period had over a three-fold risk of 3–5 depressive symptoms (adj relative risk ratio [RRR] = 3.3; 95% confidence interval [CI], 2.6–4.3) compared to a two-fold risk for women experiencing a stillbirth (adj RRR = 1.9; 95% CI, 1.7–2.1). After early postneonatal deaths, women with higher levels of education were more likely to suffer 3–5 depressive symptoms (adj relative risk [RR] = 10.6; 95% CI, 5.2–21.7, ≥ 10 years of education) compared to women with lower levels of education (adj RR = 2.0; 95% CI, 1.6–2.4, no education; adj RR = 2.2; 95% CI, 1.6–2.9, 1–9 years of education).

Conclusions: Women's mental health needs should be prioritized in low-resource settings, where these outcomes are relatively common and few mental health services are available.

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Introduction

According to the World Health Organization, major depression is the leading cause of years lived with a disability and the second leading cause of disability-adjusted life years among women of reproductive age in low- and middle-income (LAMI) countries [1]. Given the high burden of depressive symptoms in women in

resource-scarce contexts [2,3], it is important to identify risk factors for depressive symptoms in LAMI countries, where risk factors are not well identified.

Possible risk factors for depression may include stillbirth and neonatal death, both highly traumatic events that can result in profound distress [4]. In Bangladesh, stillbirth and neonatal death are estimated to be 28 and 37 per 1000 births, respectively [5]. Little is known about depressive symptoms after such adverse experiences in Bangladesh, despite the fact that these rates are over five times higher than in high income countries [6,7]. Reporting problems, small sample size, hospital-based samples, and limited adjustment for confounders constrain research on pregnancy loss and maternal depression in LAMI countries [8–12]. Composite

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variables are often used to address lack of power, such that stillbirths are combined with neonatal loss, limiting our understanding of the mental health impact of loss of a live-born infant relative to a stillbirth. If identified as important risk factors, care for women experiencing stillbirth and neonatal death could be addressed by government policies (e.g., extending maternity rights to mothers of unborn children, or options to delay women's return to work if formally employed) to help mothers cope with such experiences [13]. Knowing the relative impact of different loss experiences may help policymakers or public health interventionists to better focus initiatives on the most affected women.

Some anthropologists posit that in settings of extreme hardship, mothers may be fatalistic and accepting of infant death [14]. On the other hand, in Bangladesh, special care is given to a woman during the 40-day lay-in period after delivery of a live baby [15]. Women may experience distress if this support is not provided after a perinatal death or if they believe the loss means they have not fulfilled their childbearing role. Multiple stressors such as poverty, loss of a son, or the birth of a girl in South Asian cultures may also precipitate more severe depression if women are blamed for the death or for the birth of a girl [16].

Our study objective was to examine stillbirth and neonatal death as predictors of depressive symptoms in women reporting these events at 6 months postpartum. We hypothesized that neonatal deaths result in higher levels of depressive symptoms than stillbirth. Given strong son preference in Bangladesh [17], we also hypothesized that mothers with neonatal death of a boy are more likely to experience depressive symptoms than mothers losing a girl. Finally, because lower education is a risk factor for depression generally [18], is associated with anxiety after early pregnancy loss [19], and is related to higher fertility and greater likelihood of infant mortality [20–22], we hypothesized that low education would be associated with depressive symptoms for mothers experiencing stillbirth and infant death.

Material and methods

Participants and setting

We performed a secondary analysis using data from 41,348 married women aged 13–44 years, originally collected for the JiViTA-1 study. JiViTA-1 was a cluster randomized, double-masked, placebo-controlled, community trial. It was originally designed to examine the effect of maternal vitamin A and beta carotene supplementation (given to pregnant women in the first 12 weeks of pregnancy) on maternal mortality in northwest Bangladesh [23].

JiViTA-1 took place in two rural districts of Bangladesh, Gai-bandha and Rangpur. These two contiguous districts, covering 435 sq km, contain 596 villages or small groupings called “sectors”. About 85% of households in the study area lack electricity, and most houses are made of dirt covered with tin roofs. Most men engage in subsistence agriculture, wage labor, or own small businesses. About 60% of the women do not work outside the home. At the start of the study, 40% of women were illiterate, and 93% had <10 years of education [23]. In the study area, 93.75% deliveries occur at home, 5.74% in a facility, and 0.51% en-route to a facility or in an unspecified location (unpublished data).

Procedure

The JiViTA-1 study took place between August 2001 and October 2007. Before enrollment, a census of married women of reproductive age residing in the study areas was conducted and women were enlisted for five-weekly pregnancy surveillance, based on being 13–44 years, married and residing with the

husband, and not menopausal or sterilized. Newly married women were enlisted for surveillance over the course of the trial, based on being registered with the trial within 4 months of marriage. To identify pregnant women, all eligible women were visited at home every 5 weeks and asked about their menstrual history. A urine test was used to identify new pregnancies for women reporting amenorrhea in the past 30 days. Women providing oral consent were randomized into three weekly supplement groups: vitamin A, beta carotene, and placebo.

At enrollment, trained interviewers conducted face-to-face interviews with participants to obtain information on demographic variables and maternal health status. Information on birth outcomes, including stillbirths and early infant deaths, was collected at 3 months postpartum. Postpartum depressive symptoms were assessed 6 months after the event (median, 24.7 weeks; mean, 29.3 weeks, SD = 11.4) and asked about the “past 6 months” using a five-item scale developed in the study population.

The Johns Hopkins Bloomberg School of Public Health Institutional Review Board and the Bangladesh Medical Research Council granted ethical approval for the study.

Measures

Maternal postpartum depressive symptoms were assessed referring to the prior 6 months based on questions modified from the Patient Health Questionnaire and the Center for Epidemiologic Studies Depression Scale; there were no validated scales for depression in Bangladesh at the time. Items were pilot tested in focus group discussions to identify symptoms from the two scales that were well-understood locally. A professional translator first translated the items from English into Bangla and another independently back translated the items into English. A standard question about suicidal ideation was added. The final, five-item scale included: feeling sad all the time; becoming more forgetful; crying all the time; having thoughts of hurting oneself; and not wanting to bathe or eat for several days (Cronbach alpha = 0.72). Women were asked if they experienced any of these symptoms in the last 6 months. The five depressive symptoms items were summed and categorized into three groups: zero, 1–2, and 3–5 symptoms. Although the cutoffs we used served only as descriptive indicators, our classification for high-depressive symptoms was three or more symptoms, which 14% of the sample experienced. This makes it a more stringent cutoff compared to other reported prevalence estimates evaluated on the Edinburgh Scale for Postpartum Depression in rural Bangladesh [24,25].

Pregnancy outcomes were categorized into four groups: live birth, stillbirth (fetal loss from 28 weeks gestation to delivery), early neonatal death (0–7 days), late neonatal death (8–28 days), and an “early” postneonatal death (between 29 and 180 days postpartum). Newborn sex was included as a covariate as were demographic variables: maternal age (≤ 19 , 20–29, ≥ 30), parity (zero vs. ≥ 1), maternal education (0, 1–9 years vs. ≥ 10 years), living standard index in quartiles (first = low, second, third, vs. fourth = high), religion (non-Muslim vs. Muslim), and number of children aged ≤ 12 years in the household (0, 1, ≥ 2). A living standard index was constructed based on principal component analysis and included household assets (e.g., toilet facilities, beds, radios) [26].

Maternal nutritional status was evaluated with mid-upper arm circumference (< 21.5 vs. ≥ 21.5) and possible anemia in the first trimester (yes, no) was defined as symptoms of breathlessness at rest resulting in an inability to work, based on the World Health Organization's definition. Infection in the first trimester (none vs. urinary tract infection, gastroenteritis, or both) was used as a proxy for maternal morbidity during pregnancy.

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