

## The depression status of mothers whose newborns required mechanical ventilation

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### Abstract

**Objective:** It was aimed to evaluate the emotional status of the mothers whose newborns required mechanical ventilation in the neonatal intensive care unit due to any disease compared to mothers whose new-borns did not require mechanical ventilation.

**Material and methods:** A survey study was carried out among the mothers whose newborns required mechanical ventilation in the neonatal intensive care unit of Ministry of Health Okmeydani Training and Research Hospital between May 1, 2017 and November 1, 2017 due to any disease by one on one interview using Beck Depression Inventory (BDI).

**Results:** In the study, 50 new-borns (mechanical ventilation group) who were mechanically ventilated during the neonatal period, and 50 newborns (control group) who were not mechanically ventilated during the neonatal period, but hospitalized due to any reason and their mothers were evaluated. The mean BDI value of the mothers whose newborns underwent to a mechanical ventilation ( $14.0 \pm 11.2$  points) was found to be significantly higher than that of mothers in the control groups, statistically ( $7.6 \pm 4.7$  points;  $p=0.001$ ).

**Conclusion:** BDI scores of the mothers whose newborns underwent to mechanical ventilation were higher than those of the mothers whose new-borns did not have a mechanical ventilation. The lower BDI scores were correlated with the higher education level, younger age and having a job. Mothers whose newborns undergo mechanical ventilation should be followed up in terms of depression, and supported psychologically, if they are suspected of depression.

**Keywords:** Depression, Mechanical ventilation, Mother, Newborn.

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## Introduction

Depression is a condition involving a general unhappiness, an indifference exhaustion, an extreme sadness, an inability to enjoy life, an introversion and estrange of oneself from social life, and a feeling of worthlessness and ineffectiveness [1]. The main symptoms of depression are a depressive affect, a decrease in interest to hobbies or all activities, an insomnia or hypersomnia, a constant decrease of appetite or a significant weight loss (loss 5% of weight

per month), fatigue or a feeling of low energy, a psycho-motor regression or agitation, a reduced ability to think and decision-making, a loss of concentration, worthlessness, an inappropriate thoughts, such as excessive feeling of guilt, repetitive death/suicidal idea, which can be recognized by other people almost every day [2]. The most accepted classification system for depressive illnesses in the world is the DSM (Diagnostic and Statistical Manual of Mental Disorders), which is a classification system of the American Psychiatric Association Diagnostic Criteria. In DSM-V identified the depression as “*frequent verbal or behavioral heavy*

*anger bursts that are disproportionately in terms of frequency or magnitude depending on the situation affecting the person in environment” [2].*

Although having a baby is a happy event for many women in postpartum, this situation could initiate depressive symptoms and disorders. Patients may have mild depressive, often self-limiting symptoms including maternity blues or severe findings, such as minor/major depression [3]. Depression might be seen during pregnancy or within the first four weeks after birth according to DSM-V and is considered as "peripartum depression" [2]. It is clear that even mothers who have healthy new-borns are considered to be at risk for a peripartum depression, whereas mothers whose new-borns have respiratory distress due to various health problems and vital risk can be affected in a much more negative way. There are many negative consequences on mother, baby and family, such as problems with breastfeeding, difficulties in establishing a healthy relationship between mother and baby, and the inadequate feeding of baby by mother.

In this study, we aimed to evaluate the emotional status of the mothers whose new-borns required a mechanical ventilation in the neonatal intensive care unit due to any disease comparing to mothers whose new-borns did not require a mechanical ventilation by one-on-one interview using Beck depression scale.

## Materials and Methods

A survey study was carried out among the mothers whose new-borns required a mechanical ventilation in the neonatal intensive care unit of Ministry of Health Okmeydanı Training and Research Hospital between May 1, 2017 and November 1, 2017 due to various diseases by one on one interview using Beck depression scale. Both mothers whose new-borns were mechanically ventilated during the neonatal period (mechanical ventilation group) and accepted to participate in the study and mothers whose new-borns were not mechanically ventilated, but hospitalized due to any reason (control group) and accepted to participate in the study were included. No samples have been calculated since there was no previously determined rate of depression. The study was carried out with the permission of the Ministry of

Health Istanbul Okmeydani Education and Research Hospital Ethics Committee dated 03.02.2017 and numbered 649. The written consent form was received from mothers who participated in the study. The questionnaire was performed by one-on-one interview with the mothers of the selected cases. The gender, gestation week, birth weight of new-borns, the ages and education levels of mothers, the delivery method, the duration of mechanical ventilation and hospitalization were recorded. The Beck Depression Inventory (BDI) was applied to evaluate the depression status of mothers and then the results of mothers whose new-borns were mechanically ventilated during the neonatal period (mechanical ventilation group) were compared with those of mothers whose new-borns were not mechanically ventilated, but hospitalized due to any reason (control group). The BDI is a 21-item self-reporting questionnaire to evaluate the severity of depression in normal and psychiatric populations [4-6]. It depended on the theory of negative cognitive distortions as central to depression [7]. It was revised in 1978: the BDI-IA and 1996 and the BDI-II, both copyrighted [8]. The BDI-II does not depend on any particular theory of depression and the survey has been translated into several languages. A shorter form of the survey, the BDI Fast Screen for Medical Patients (BDI-FS), is available for primary care use. That version covers seven self-reported items each corresponding to a major depressive symptom in the preceding 2 wks.

Variables were described as mean  $\pm$  standard deviation. The research data were evaluated in the SPSS 16.0 program. For the study data, charts showing absolute and percentage numbers were prepared and arithmetic averages were taken where necessary, chi-square test and independent sample student t test or its non-parametric counterpart Mann-Whitney U test and Pearson correlation analysis were used as statistical analysis.  $P < 0.05$  was considered statistically significant..

## Results

In the study, 50 new-borns (mechanical ventilation group) who were mechanically ventilated during the neonatal period, and 50 new-borns (control group) who were not mechanically ventilated during the neonatal period and their mothers were included. Of the 50 new-borns who were mechanically ventilated, 26 were male

(52%), 24 were girls (48%), of the 50 new-borns who were not mechanically ventilated, 19 were male (38%) and 31 were girls (62%). No statistically significant difference was found between the two groups in terms of gender ( $p=0.159$ ). The normal spontaneous vaginal route was recorded in fifteen new-borns (30%) that belonged to the mechanical ventilation group and 18 new-borns (36%) that belonged to the control group, as 35 (70%) in the mechanical ventilation group and 32 (64%) in the control group were born by cesarean delivery ( $p=0.523$ ).

The means gestational ages were  $30.2 \pm 3.0$  weeks in the mechanical ventilation group and  $37.2 \pm 2.1$  weeks in the control group. There was a significant difference between the gestational ages of the mechanical ventilation group and those of the control group ( $p=0.0340$ ). The mean weights of new-borns who required a mechanical ventilation ( $1540 \pm 620$  gr) was found to be less than that of new-borns who did not require a mechanical ventilation ( $2660 \pm 400$  gr;  $p=0.0329$ ). The mean age of the mothers whose new-borns were mechanically ventilated ( $24.9 \pm 3.6$  yrs) was found to be similar with the mean age of the mothers whose new-borns were not mechanically ventilated ( $24.6 \pm 3.5$  yrs), statistically ( $p=0.655$ ).

Education levels of the mothers between two groups were found similar ( $p=0.068$ , Figure 1). It was recorded that 8 (16%) mothers in the mechanical ventilation group and 12 (24%) mothers in the control group had a job, as 42 mothers (84%) in the mechanical ventilation group and 38 (76%) in the control group were housewives ( $p=0.317$ ). Two mothers (4%) in both groups had a history of stillbirth in the previous pregnancies. Likewise, two mothers (4%) in both groups had a history of infant death in the postnatal period of previous pregnancies.

In the patient group, four families (8%) had children who had a history of intensive care, as the three families (7%) had children who had a history of intensive care ( $p=0.695$ ). The numbers of families that had a history of mechanically ventilated new-borns in their relatives were three (6%) in the patient group and two (4%) in the control group ( $p=0.646$ ). The mean numbers of children were found to be similar in both groups ( $p=0.833$ ; Figure 2).

The mechanical ventilation day ranged from one to six days (median day=1). The number of new-borns who underwent to a mechanical ventilation in the first day of birth was 41 (82%). The mean duration of mechanical ventilation was  $12.5 \pm 5.5$  days and ranged from five to 30 days. The means duration of hospitalization were  $26.7 \pm 5.2$  days (19-48 days) in newborns who required a mechanical ventilation and  $12.5 \pm 3.3$  days in newborns who did not require a mechanical ventilation (7-18 days). The mean duration of hospitalization in the mechanical ventilation group was significantly longer in new-borns who did not require a mechanical ventilation ( $p=0.013$ ). No patient died in both groups, but three patients (6%) in both groups left our hospital refusing the medical procedures before their treatment was completed.

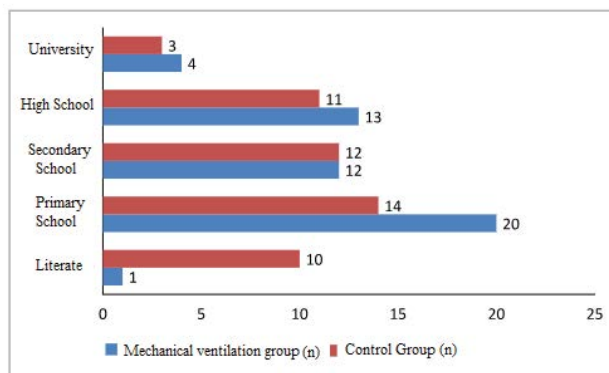


Figure 1: Maternal education levels in the mechanical ventilation and control groups.

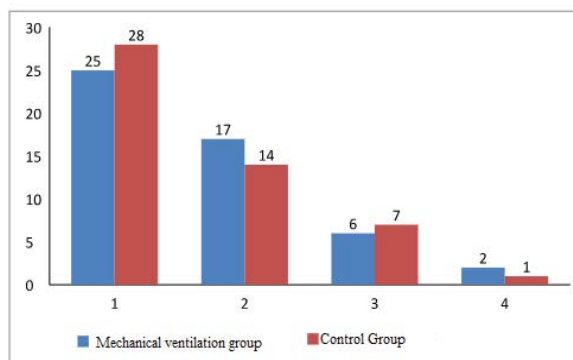


Figure 2: The number of children in the families by the patients and control groups.

The mean BDI value of the mothers whose new-borns underwent to mechanical ventilation ( $14.0 \pm$

11.2 points) were found to be significantly higher than that of mothers in the control groups, statistically ( $7.6 \pm 4.7$  points;  $p=0.001$ ). BDI values were found to be within normal range in 37 mothers (74%) of the control group, and 26 mothers (52%) of the mechanical ventilation group. In the mechanical ventilation group, the number of mothers in the moderate, severe and extreme depression levels was 9 (18%), whereas the control group had no mother in the moderate, severe and extreme depression levels (Figure 3).

It was observed that the BDI scores increased with decreasing maternal age, gestational age and birth weight, but no parameter was found to be significant statistically. There was a statistically significant weak correlation in the negative direction between the maternal ages and the BDI scores ( $r=-0.451$ ;  $p=0.001$ ) (Figure 4).

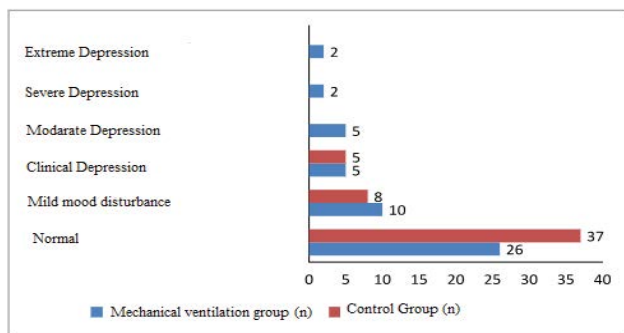


Figure 3: The Beck depression inventory scores of mothers

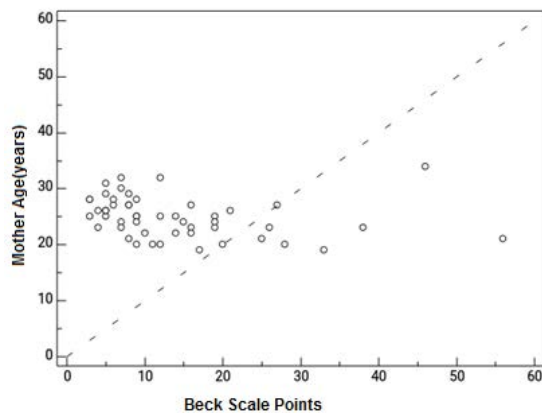


Figure 4: The correlation analysis between BDI scores and maternal ages

Mothers whose new-borns required a mechanical ventilation were categorized by maternal age (<25

yrs and >25 yrs), duration of mechanical ventilation (<10 days and >10 days), (gestational age <32 weeks and >32 wks), birth weight (<1200 gr and >1200 gr) and hospitalization period (<20 days and >20 days) and there was no difference between categorizing groups in terms of the BDI scores. The mean BDI score of mothers who were older than 25 yrs were higher than those of mothers who were  $\leq 25$  yrs ( $p=0.002$ ) (Table 1).

Table 1: Beck depression inventory scores in the patient group.

		n	Mean $\pm$ SD	P-Value
Mother's age	<25 yrs	27	10.4 $\pm$ 9.2	0.002
	>25 yrs	23	18.2 $\pm$ 12.0	
Mechanical ventilation time	<10 day	17	14.5 $\pm$ 13.8	0.820
	>10 day	33	13.7 $\pm$ 9.8	
Gestational age	<32 wks	37	13.0 $\pm$ 9.5	0.308
	>32 wks	13	16.7 $\pm$ 15.1	
Birth weight	<1200 gr	21	14.1 $\pm$ 10.0	0.948
	>1200 gr	29	13.9 $\pm$ 12.1	
Hospitalization time	<20 day	20	15.2 $\pm$ 13.0	0.531
	>20 day	30	13.2 $\pm$ 9.9	

BDI were assessed in terms of the birth order of new-born, first intubation day after birth for a mechanical ventilation, a similar experience with her previous children or in relatives, a history of stillbirth or an infant death, the gender of the baby, the type of delivery, education level of the mother, and job status of the mother. The mean BDI score was found to be lower in the mothers had graduated from university or high school ( $8.1 \pm 5.2$  points) compared to mothers who graduated from primary or secondary school ( $12.1 \pm 10.2$  points;  $p=0.012$ ). Likewise, the mean Beck depression scale score was lower in mothers who had a job ( $6.3 \pm 3.2$  points) compared to other mothers ( $12.0 \pm 9.8$  points;  $p=0.004$ ). When only the new-borns who underwent to mechanical ventilation were taken into consideration, the mean Beck depression scale score of mothers who graduated from high school or university ( $8.1 \pm 5.7$  points) were lower than mothers who graduated from primary or secondary schools ( $17.14 \pm 12.1$  points;  $p=0.001$ ). If only the new-borns connected to mechanical ventilation are considered, the mean Beck depression scale score of the mothers who had a job ( $6.7 \pm 1.6$  points) were found to be lower than that of mothers who were housewives or had no job

(15.4 ± 11.7 points; p=0.015).

The mean BDI of mothers whose new-borns underwent to a mechanical ventilation (8 ± 5.7 points) was found similar with that of mothers whose new-borns did not undergo a mechanical ventilation in terms of educational and working status of mothers (8.1 ± 4.7; p=0.710).

## Discussion

In postpartum depression, mothers' new-born relationship is severely impaired. Depressed mothers have difficulty in establishing an emotional connection with the new-born. The children of these mothers experience difficulties in cognitive functioning as well as behavioral and emotional difficulties [9]. Many women feel guilty to have a depressive mood, she could not be happy when she should be happy. They generally hide their symptoms and feel a postpartum depression without an impression. For this reason, postpartum depression is an important condition that should be kept in mind during pregnancy and puerperium in terms of primary health care [10,11].

In our study, emotional status of mothers whose new-born underwent to a mechanical ventilation due to any reason was considered to be an important factor related to health, care and feeding of baby during the hospitalization and after discharge. The rehabilitation of those mothers who have depression or depressive mood influences the development of new-borns directly and indirectly. BDI could be useful to detect a depression in the mothers, as some mothers could hide their emotion not to be criticized.

In a study that evaluated the symptoms of postpartum depression and the relationship between breastfeeding and factors affecting postpartum depression symptom using the Edinburgh Postpartum Depression Scale, 24.7% of the mothers were diagnosed with depression. And the risk of having a postpartum depression in mothers whose educational level was at primary school and below is 4.4 times higher than those in high school and above. In the same study, the rate of postpartum depression was found to be 2.8 times higher in mothers who live with extended family; 3.1 times in mothers who had a history of depression, 4.8 times in mothers who had a history of premenstrual syndrome, 2.8

times in mothers who received little support from her husbands and 9.4 times in the women with severe stress in her life. In addition, depression was not found to be associated with giving up breastfeeding and starting with supplementary food [12]. In our study, the depression rate in the patient group was 18% and mothers who are graduated from a high school or a university had a less BDI scores that were similar to the results of the above-mentioned study. The prevalence of pregnancy depression was found to be high as 25.5% in a study that used the Edinburgh Postpartum Depression Scale [13]. The pregnancy depression was found to be associated with the age, educational status, absence of health insurance, marital status, the number of marriages, the first marriage age, the type of marriage, the education and employment status of the husband, having no home, the number of people living together at home and their behaviors, the involuntary pregnancy development, fertility characteristics, a diagnosis of early depression or previous pregnancy/postpartum depression, a presence of depression in first degree relatives, chronic diseases, significant medical problems or nausea and vomiting due to pregnancy, having problems with spouses or the family, and failure to share problems with friends [14]. In our study, factors such as mothers' age of more than 25 yrs, low education level, being a housewife or being unemployed were found to be related to depression.

Mothers who had premature births were examined from the perspective of trauma, depression, maternal attachment and quality of life, BDI scores. The depression scores of mothers working were lower than those who were not. A higher depression scores were reported in the mothers, who suddenly learned to have a premature birth compared to mothers already informed. The depression scores were reported to decrease as the ages of mothers' increases. The devotion scores of mothers who had a new-born with a low birth weight or premature birth were found to be higher [14]. In our study, having a job was related to have a better mood in the mothers.

In a study investigating stress factors in the mothers of new-borns watched in a neonatal intensive care unit, State-Trait Anxiety Inventory was applied. When the new-borns had a prolonged hospitalization period or the mother had a small gestational age or a new-born

with a low birth weight or the mother was susceptible to depression, the time of contact with the new-borns increased and the new-borns were constantly looking at their new-borns. The level of depression and anxiety decreased as the level of education increased. Factors such as maternal age, depression and anxiety levels do not affect this condition. In addition, mothers with a history of infant death had a higher and sustained level of anxiety [15]. In our study, there was no difference between gestational age and birth weight and depression scores unlike this study. The depression scores were correlated with the lower level of education of mothers.

In a study that used the BDI, State-Trait Anxiety Inventory and Social Support Scale in the first 24 hours after delivery, the prevalence of depressive symptoms was reported to be 10-15% in the postpartum period. It has been determined that the symptoms of depression were not related to gestational age, marriage duration, education level, socioeconomic level, antenatal care and social support. It was determined that women with chronic physical illness had more symptoms of depression than those without. The level of trait anxiety was determined as high in all mothers [16]. In our study, there was no relationship between gestational age and depression score and it was consistent with this literature. The level of depression was found to be lower in mothers who had a higher education level in contrast to the results of the above study.

The Lactation Self-Efficacy Scale and the IOWA Milking Tendency Scale were administered to mothers who have new-borns in the neonatal intensive care unit. The mothers, who are 36 yrs of age or older, or graduated from a university, or were planning to have a pregnancy or were working, had a higher mean IOWA point. It was found that mothers who had a breastfeeding experience had a higher mean score on the breastfeeding self-efficacy scale [17]. Our study results also suggest that mothers with low levels of education should be supported in terms of depression or depressive mood at this period.

The limitations study were based the inclusion of a certain number of mothers in the study who presented at a certain time, the representation of mothers in a specific region due to the fact that the study was conducted in a single center as well as the educational

level and the economic distributions of the mothers included in the study that were not similar.

## Conclusion

BDI scores of the mothers whose new-borns underwent to a mechanical ventilation were higher than those of the mothers whose new-borns did not have a mechanical ventilation. The lower BDI scores were correlated with the higher education level, younger age and having a job. Mothers whose new-borns undergo a mechanical ventilation should be followed up in terms of depression, and supported psychologically, if they are suspected of depression.

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