Effect of Mindfulness-Based Stress Reduction (MBSR) on Oxytocin Levels and Stress in Breastfeeding Mothers

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Track Record Article

Accepted: 23 July 2023
Revised: 15 November 2023
Published: 17 December 2023

How to cite :
Mardiah, Sumarni, S., & Isnawati, M. (2023). Effect of Mindfulness-Based Stress Reduction (MBSR) on Oxytocin Levels and Stress in Breastfeeding Mothers. *Contagion : Scientific Periodical of Public Health and Coastal Health*, 5(4), 1257–1269.

Abstract

The prevalence of exclusive breastfeeding in various cities of Bangka Belitung Province varies, where in 2018 from January to June, the prevalence of exclusive breastfeeding in Bangka Belitung Islands Province was relatively low (57.6%). The problem of milk production is influenced by the reduced stimulation of oxytocin hormone. One of the non-pharmacological therapies that can be done is relaxation by doing Mindfulness therapy. The aim was to determine the effect of mindfulness-based stress reduction (MBSR) on oxytocin levels and stress in breastfeeding mothers for 2 weeks consisting of 8 sessions in 3 meetings. The research method used was quantitative with a quasi experimental research design (pretest-posttest control group design). Penelitian ini dilakukan at Regional General Hospital Dr. (HC) Ir. Soekarno, Bangka Belitung Province in 2023. Dilaksanakan pada bulan Januari sampai dengan Maret 2023. The population in this study were breastfeeding mothers at Regional General Hospital Dr. (HC) Ir. Soekarno, Bangka Belitung Province with a sample of 36 using purposive sampling technique. Data were collected using a questionnaire. Data analysis was univariate and bivariate dengan uji t-test and Mann Whitney test . The results of mindfulness-based stress reduction increased oxytocin hormone levels in breastfeeding mothers for 2 weeks consisting of 8 sessions in 3 meetings lasting 150 minutes per meeting and mindfulness-based stress reduction decreased stress scores in breastfeeding mothers for 2 weeks consisting of 8 sessions in 3 meetings lasting 150 minutes per meeting. It is recommended that midwives provide information about Mindfulness therapy to increase the hormone oxytocin in breastfeeding mothers and can play an active role in overcoming the problems of breastfeeding mothers who experience anxiety or worry about producing breast milk and breastfeeding babies.

Keywords : Brestfeeding mothers, MBSR, Oxytosin levels

INTRODUCTION

Breast Milk is breast milk that given to babies since they were born for six months, without adding and or replacing it with other food or drinks such as except medicines, vitamins and minerals. Breast Milk contains colostrum which is rich of antibodies because it contains protein for immunity and it is useful for killing germs in high numbers so that exclusive breastfeeding can reduce the risk of death to babies (Kemenkes RI, 2021).

The low of exclusive breastfeeding in Indonesia because of many reasons, including because breast milk does not come out 65.7%, children cannot breastfeed 6.6%, complicated 2.2%, separated mom and children 8.4%, medical reasons 5.7%, children separated from their mothers 5.4%, mothers died 1.5%, and others 4.5% (Kemenkes RI, 2021). Low exclusive breastfeeding will affect the growth and development of babies. This is in line with previous

research which stated that as many as 58.8% of babies experienced abnormal growth due to not consuming colostrum at the beginning of their development (Novianita et al., 2022).

The prevalence of exclusive breastfeeding in various cities of Bangka Belitung Province is variative where in 2018 January - June, the prevalence of exclusive breastfeeding in the Bangka Belitung Islands Province was relatively low 57.6%, especially in South Bangka Regency 44.91%, West Bangka Regency 45.86%, Central Bangka Regency 48.67%, Pangkalpinang City 63.01%, Belitung Regency 63.39%, East Belitung Regency 65.98%, and Bangka 70.02% (Aguszulkia et al., 2020).

Many factors are associated with milk production such as frequency of breastfeeding, baby's weight at birth, gestational age at birth, mother's age and parity, stress and severe illness, early initiation of breastfeeding, presence of smokers, alcohol consumption, breast care, use of contraceptives and nutritional status. Mother's factor in problem of breastfeeding is milk does not come out, the problem with breastfeeding is affected by reduced stimulation of the hormone oxytocin (Foong et al., 2020; Dian et al., 2019). In addition, several studies explain that as many as 50% of mothers after giving birth experience stress and depression, almost 80% (Qomari et al., 2019). New mothers experience feelings of sadness after giving birth or often called post partum stress.

The hormone oxytocin is formed from a prohormone, in the form of a nonapeptide. The molecular weight is 1007. Secreted down along the axons of neurons where cell bodies are located in the supraopticus and paraventricular nuclei. On its way, oxytocin binds to carrier proteins known as neurophysins I and II or estrogen and nicotine stimulate each neurophysin which has a molecular weight of about 10.000, and secreted directly into the portal circulation than the peripheral circulation. Small amounts of oxytocin are also released into the portal circulation. The pro-oxytocin time is about 10 minutes (Thul et al., 2020).

The hormone oxytocin, also known as the love hormone, is a hormone that plays an important role in stimulating the release of milk from the mother's breasts. This hormone is strongly influenced by the mother's mood. It is important for mothers who are breastfeeding to maintain their emotions and moods. If the mood is bad, it will affect the production of little milk. Always positive and cheerful thinking will expedite the release of more milk.

Mindfulness is the process of bring improvement attention to the non-elaborative qualities of waking awareness of experiencing now, as opened experienced, mindful, and accepting of what is. Mindfulness practice was developed by Kabat-zinn (1990) in 1990 which is rooted in Buddhist philosophy. Mindfulness is a skill that can help individuals to have

awareness of a present experience intentionally and without judgment in order to be able to respond with acceptance, rather than react, to daily experiences (Maharani, 2016).

Mindfulness training can significantly reduce stress levels, this has been proven by research conducted by Maharani where Mindfulness-Based Stress Reduction conducted on pregnant women mindfulness training can reduce distress levels in physical, behavioral, cognitive, and emotional aspects (Hapsari et al., 2021).

The benefits of mindfulness-based stress reduction (MBSR) therapy are being able to increase positive emotional regulation in individuals with social anxiety Munazilah et al., (2018) increase emotional sensitivity and self-acceptance of various emotional expressions in individuals with physical disorders reduces stress conditions by modifying the processes of cognition and affection so that they affect emotional regulation, physical sensation, and self-confidence (Handayani et al., 2021; Gerliandi et al., 2021).

Based on the results of a pre-survey conducted at the Dr. Regional General Hospital. (HC) Ir. Soekarno, Bangka Belitung Province in September 2022, There were 68 mothers who gave birth vaginally. Brief interviews with 15 postpartum mothers showed that all mothers did not breastfeed their babies from the first to the second day postpartum. The reasons expressed by 15 mothers were that as many as 13 (86.7%) had not yet produced breast milk, and were afraid that breastfeeding would hit the stitches so they were afraid of the stitches coming loose if they were touched by the baby's body or if the mother moved a lot and as many as 2 (13.3%)) has come out but doesn't know how to breastfeed after giving birth. Furthermore, researchers measured stress using the Depression Anxiety Stress Scales (DASS) as many as 12 (80%) mothers fell into the stress category from mild - moderate (15 - 25 points), with symptoms of finding it difficult to rest and feeling irritable, irritable. restless, irritable, angry about small or trivial things, feeling anxious.

The hospital has made various efforts to reduce stress and increase breast milk production, such as providing food consumption that can increase breast milk production, creating a calm environment, teaching oxytocin massage to mothers and families, playing music in the room but these efforts have not been successful because there are still mothers who reveal that breast milk production is small and it is still difficult to rest. The hospital has never carried out mindfulness-based stress reduction (MBSR) therapy because it still does not have competent personnel for this intervention, apart from that the hospital does not yet have standard operating procedures related to mindfulness-based stress reduction.

Based on the description of the background above, researchers are interested in conducting research on the effect of mindfulness-based stress reduction on oxytocin levels and stress in breastfeeding mothers.

METHODS

The research design that used was quasi-experimental (Pretest-Posttest Control Group design). This design is more applicable to test causal relationships between two groups where random selection is not possible. In this study, researchers used an analytical design using the Pretest-Posttest Control Group Design approach (Sugiyono, 2018).

The research was conducted from January to March 30 2023. This research was conducted on primigravida postpartum mothers on days 1 to 7 at Regional General Hospital Dr. (HC) Ir. Soekarno, Bangka Belitung Province in 2023. Based on the total sample count, the number of respondents was 18 people in the intervention group and 18 respondents in the control group, so that the total becomes 36 respondents.

The sampling technique used was purposive sampling, namely samples that were available or found during the research period.

Research instrument this the questionnaire was used as an evaluation and measures the success rate of Mindfulness-Based Stress Reduction implementation which affects the oxytocin levels of breastfeeding mothers. The questionnaire contains the demographic characteristics of the respondents. The Enzyme-Linked Immunosorbent Assay (ELISA) instrument was used to examine the levels of oxytocin in the serum of lactating mothers using the Elabscience (China) insert kit.

Research procedure dengan providing a Mindfulness-based stress reduction intervention consisting of 8 sessions in 3 meetings with 150 minutes duration per meeting in intervention group, from the first day of observation to day 14. This intervention was carried out by researchers and enumerators starting January 12, 2023 – March 30, 2023.

Mindfulness-based stress reduction interventions are: Session I : relationship building and introduction to Mindfulness (10 minutes), Session II : Mindful Breathing (10 minutes), Session III : Body Scan Meditation (20 minutes), Session IV : letting go of desires and wish (20 minutes), Session V : STOP (Stop, take a slow breath, observe, treat yourself lovingly) (20 minutes) , Session VI : hug yourself (self-compassion) (20 minutes), Session VII : mindfulness in everyday life (20 minutes), Session VIII : Review and planning (15 minutes.).

The researcher gave an anxiety observation sheet to the control group. The observations were carried out for 2 weeks starting from January 12 2023 – March 30 2023. Then continued with taking blood samples to check levels of the hormone oxytocin.

Data analysis in this study using the Paired Simple t-test was used to analyze differences in levels of the hormone oxytocin and levels of anxiety before treatment and after treatment in paired groups, namely the intervention group and the control group, after previously conducting a data normality test using the Shapiro Wilk test which showed that all data is normally distributed.

The Independent Sample Test was used to analyze differences in oxytocin hormone levels and anxiety levels in unpaired groups between the pre-intervention group and the pre-control group as well as the post-intervention group and the post-control group.

And the Mann Whitney test was used to analyze the difference in the means of the intervention group and the control group and determine the p-value with a confidence level of 95% or the value $\alpha = 0.05$ of the effect of the intervention on the two intervention groups and the control group on the variables of oxytocin hormone levels and anxiety levels.

RESULTS

Table 1. Characteristics of respondent

Characteristic Respondent	Group			
	Intervention (n=18)	%	Control (n=18)	%
Age				
Min – Max	20 – 36		18 – 34	
< 20 and > 35 years old	7	38,9	5	27,8
20 – 35 years old	11	61,1	13	72,2
Education				
Elementary – Middle School	3	167	18	22,2
Senior high school – Bachelor	15	83,3	4	77,8
Job				
Worker	4	22,2	3	16,7
Jobless	14	77,8	15	83,3

In table 1, the age characteristics of respondents in the intervention group were mostly mothers aged 20-35 years, namely 61.1%, and in the control group 72.2%.

Regarding the educational characteristics of respondents in the intervention group, there were 3 respondents (16.7%) with primary school and junior high school education and 15 respondents with education > junior high school (83.3%). In the control group with primary school and junior high school education, there were 4 respondents (22.2%) and education > junior high school, 14 respondents (77.8%).

Regarding the job characteristics of respondents in the intervention group with working status were 4 respondents (22.2%) and non-working status 14 respondents (77.8%) and in the control group

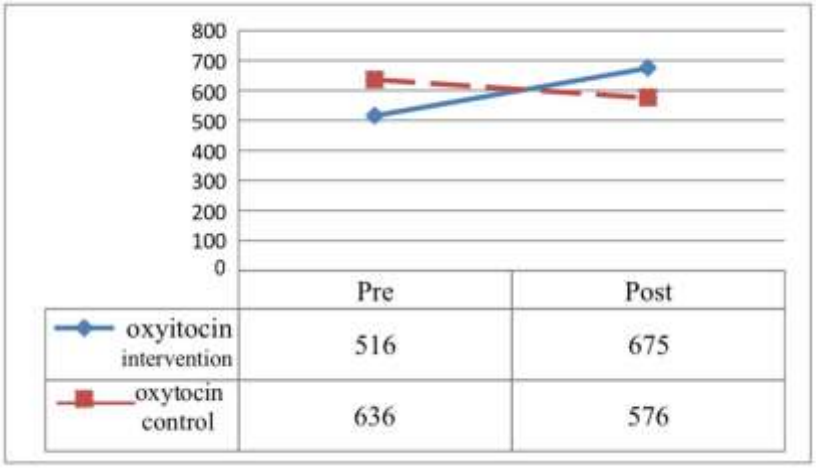
with working status were 3 respondents (16.7%) and non-working status. 15 respondents (83.3%) worked.

Table 2. Analysis of the Effect of Mindfulness-Based Stress Reduction (MBSR) on Oxytocin Hormone Levels in Breastfeeding Mothers

Variable	Data	Group		*p-value*
		Intervention Mean ± SD	Control Mean ± SD	
Oxytocin levels	Pre	516,17 ± 260,82	636,26 ± 204,45	0,13**
	Post	675,56 ± 255,17	576,38 ± 192,93	0,19**
p-value		0,01*	0,04*	
	Difference	159,39 ± 245,76	-59,89 ± 115,99	0,002***

**Pairded Sample T-Test **Independent Sample T-Test ***Man Whitney*

Based on Table 2, the effect of Mindfulness-Based Stress Reduction for the intervention group showed a mean difference of 159.39, then for the control group the mean was -59.89. Based on the Paired Sample T-Test in the intervention group, it was found that $p<0.05$, which means there was a significant increase in oxytocin levels after being given Mindfulness-Based Stress Reduction. Meanwhile, in the control group, the difference was -59.89 with the Paired Sample T-Test showing $p<0.05$, which means that the levels of the hormone oxytocin in the control group who were given normal postpartum care management experienced a significant decrease.



Picture 1. Mean Oxytocin Hormone Level in Intervention Group and Control Group

Based on Figure 1, it is known that the average maternal oxytocin level in the intervention group increased from a value of 516 and after being given the Mindfulness-Based Stress Reduction intervention, the oxytocin level increased to 675, while the average oxytocin level in the control group given normal postpartum care decreased from 636 becomes 576.

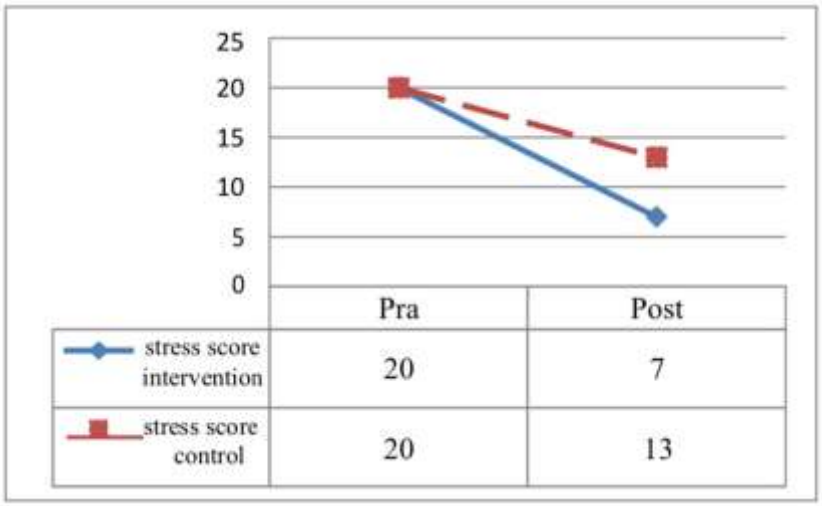
Table 3. Analysis of the Effect of Mindfulness-Based Stress Reduction (MBSR) on Stress in breastfeeding mothers

Variable	Data	Group		*p-value*
		Intervention Mean ± SD	Control Mean ± SD	
Skor Stress	Pre	20,11 ± 1,18	20 ± 1,32	0,79**
	Post	7,49 ± 1,30	13,16 ± 1,68	0,00**
p-value		0,00*	0,00*	
	Difference	12,17 ± 1,68	7,44 ± 2,14	0,00***

**Pairded Sample T-Test **Independent Sample T-Test ***Man Whitney*

Based on Table 3, the effect of Mindfulness Based Stress Reduction for the intervention group shows that the mean difference was a significant reduction in stress score levels between the intervention and control groups, but the reduction in stress scores in the intervention group was greater than in the control group. It was explained above that the analysis of the effect of Mindfulness-Based Stress Reduction on stress in breastfeeding mothers found that the mean stress intensity of mothers in the intervention group was 12.16 with a standard deviation of 1.68 and in the control group 7.44 with a standard deviation of 2.14. In both intervention and control groups, the Paired Sample t-Test was used with p=0.00 so it can be interpreted that there is an effect of intervention on maternal stress.

In the Independent Sample Test for both groups, the pre-test found p = 0.79, which means there is no difference between the groups, and in the post-test data, it was found that p = 0.00, which means there is a difference between the intervention and control groups. In both groups, the difference was found to be p=0.00, which means there is an influence of Mindfulness-Based Stress Reduction on stress in breastfeeding mothers.



Picture 2. Mean Stress Level in Intervention Group and Control Group

Based on Figure 2, it is known that the average maternal stress score in the intervention group decreased from a value of 20 and after being given the Mindfulness-Based Stress Reduction intervention, the stress score decreased to 7. Meanwhile, the average stress score in the control group that was given normal postpartum care decreased. from 20 to 13.

DISCUSSION

Mindfulness-Based Stress Reduction on Oxytocin Hormone Levels in Breastfeeding Mother

Based on the results of statistical analysis showed that the average level of the hormone oxytocin before the intervention was 516.17 pg/ml and after the intervention in the intervention group was 675.56 pg/ml with an increase of 159.39 pg/ml while in the control group there was a decrease in levels oxytocin from 636.28 pg/ml to 576.39 pg/ml decreased by 59.89 pg/ml. In the results of the analysis using the Paired Sample t-Test, there was a significant difference in the average hormone oxytocin in nursing mothers between before and after the intervention was given in the two groups, namely $p = 0.01$ (> 0.05) in the intervention group and $p = 0.04$ (>0.05) in control group. And the independent sample test showed $p = 0.002$ in the difference between two groups, it means that there is an effect of the Mindfulness-Based Stress Reduction intervention on levels of the hormone oxytocin in nursing mothers.

The hormone oxytocin acts as a hormone and a neuromodulator, influencing many people social behaviors, including reproduction. During labor and the postpartum period, it plays a key role in regulating and controlling the processes that ensure safe birth and the health of both mother and child. Especially the onset of labor, the progress of labor and early breastfeeding are mediated by oxytocin (Walter et al., 2021; Uvnäs-Moberg et al., 2019).

In order for the let down reflex to occur properly, it is necessary to stimulate the release of the hormone oxytocin by stimulating the point above the nipple, the exact point on the nipple and the point below the nipple and the point on the back that is in line with the breast. One way to stimulate the release of oxytocin is by doing massage which can also increase the mother's sense of comfort (Siregar et al., 2021; Wanda et al., 2020).

Mindfulness therapy is an exercise to handle and manage current conditions, thoughts, and feelings that are being experienced in the current situation. And consciously can help and focus on goals in solving problem that faced by mother. Mindfulness exercises can be done using the STOP technique (stop, take a breath, observe, proceed). Simple steps that can be taken to implement mindfulness in day life, including creating space and time, managing time, finding a comfortable sitting position, checking body posture, taking deep breaths, paying

direct attention to the breath, maintaining attention on your breath, repeat the steps above, then be kind to yourself, and prepare for a soft landing. This therapy can be applied for 15 minutes, and it is done regularly 3 times a week for 2 weeks. Stress arises because of the secretion of the adenalis granules which has increased so that what will cause a person's response to carry out physical activity is far greater than someone who is not experiencing stress. Prolonged stress can disrupt the function of the brain, autonomic nervous system, endocrine system and immune system so that various kinds of psychosomatic diseases can appear (Handayani et al., 2021).

Mindfulness works by achieving alpha brain waves (the lowest brain wave frequency) so that, it affects the increase in secretion of the hormones norepinephrine, serotonin and betaendorphine which is accompanied by reduction in level of blood production. The level of blood production is directly related to the emergence of stress, with a decrease in stress levels will be followed by an increase in the body's immune response (MTFS). Therefore, through mindfulness therapy, psychosomatic disease disorders can be avoided because someone who does mindfulness therapy will relax their body (Handayani et al., 2021).

According McManus et al., (2012), et al in their research showed that mindfulness training is useful to be given to patients who have health anxiety disorders (hypochondriasis). Previous research conducted by Maharani provided mindfulness training to pregnant women. The research results show that mindfulness training can significantly reduce the level of distress in the physical, behavioral, cognitive, and emotional aspects. This is in line with Ito et al., (2019) that the role of positive emotions can stimulate release of endorphins and the hormone oxytocin. The hormone oxytocin is secreted by the pituitary gland which is located at base of the hypothalamus. The pituitary gland is a kind of endocrine hormone. The endocrine system is located at the base of the hypothalamus which can affect the body from head to toe, affect physically and mentally, hormones secreted by cells in body fluids and have a psychological regulatory effect on other cells in body (Walyani et al., 2017).

Mindfulness-Based Stress Reduction to Stress Levels of Breastfeeding Mothers

Based on the results of statistical analysis, it showed that there was a significant effect on the average difference in stress of breastfeeding mothers before and after being given intervention in Mindfulness-Based Stress Reduction intervention group and control group. Because in the paired sample T-Test between the intervention group and the control group each, namely $p = 0.00$ (> 0.05). In the independent sample t-test in both the intervention group and the control group, $p = 0.00$, so it can be interpreted that there is an effect of Mindfulness-Based Stress Reduction on Stress in nursing mothers.

Postpartum stress conditions are experienced by 80% of women after giving birth. Feelings of sadness or gloom that hit the mother arise within two days to two weeks after (Aminah et al., 2022; Danuatmaja et al., 2004). The condition of mothers who are easily anxious and stressed can interfere with lactation so that it can affect milk production. This is because stress can inhibit milk (Utari et al., 2021). The higher level of emotional disturbance, the less stimulation of hormone prolactin is given to produce breast milk (Niar et al., 2021).

Stress can affect milk production because it inhibits milk production and will eventually result in breastfeeding. Stress also affects the continuity of exclusive breastfeeding. The success of breastfeeding is related to milk production while stress can affect milk production.

Mindfulness Based Stress Reduction is a program that has been proven to reduce symptoms of stress, anxiety, and depression, Mindfulness Based Stress Reduction is believed to be able to change emotional responses by modifying cognitive-affective processes (Goldin et al., 2014); Mousavi et al., 2023).

This research is in line with Zeinabeh et al., (2023) which stated that MBSR therapy can significantly reduce stress levels. Research stated that participants in the experimental group experienced a decrease in depression levels after receiving mindfulness therapy, this proves that mindfulness therapy has an effect on reducing depression levels in pregnant women who are at high risk (Kriakous et al., 2021; Kristyaningrum et al., 2022).

The results of this study indicate that mindfulness can significantly reduce stress levels, this has been proven by research conducted by Maharani where Mindfulness Based Stress Reduction conducted on pregnant women mindfulness training is able to reduce distress levels in physical, behavioral, cognitive, and emotional aspects (Hapsari et al., 2021). Mindfulness Based Stress Reduction therapy is able to increase positive emotion regulation in individuals with social anxiety disorder (Munazilah et al., 2018). Increase emotional sensitivity and self-acceptance of various emotional expressions in individuals with physical disorders, reduce stress conditions by modifying the processes of cognition and affection so that they affect emotional regulation, physical sensations, and self-confidence (Handayani et al., 2021).

CONCLUSION

The results of this research show that mindfulness-Based Stress Reduction (MBSR) affects levels of the hormone oxytocin in breastfeeding mothers for 2 weeks consisting of 8 sessions in 3 meetings with duration of 150 minutes per meeting. Mindfulness-Based Stress Reduction has an effect on stress in breastfeeding mothers for 2 weeks consisting of 8 sessions in 3 meetings with a duration of 150 minutes per meeting.

It is recommended for breastfeeding mothers, Mindfulness-Based Stress Reduction (MBSR) therapy affects levels of the hormone oxytocin and stress scores in breastfeeding mothers. Mindfulness therapy has the advantage that apart from being easy to practice, it is also therapy or positive affirmation that we can get in every activity we do. And it is recommended that midwives provide information about Mindfulness therapy to increase the hormone oxytocin in breastfeeding mothers and can play an active role in overcoming the problems of breastfeeding mothers who experience anxiety or worry about producing breast milk and breastfeeding babies.

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