THE EFFECTIVENESS OF KENIKIR EXTRACT (COSMOS CAUDATUS) TO INCREASE THE HORMONE PROLACTIN IN PUERPERAL MOTHERS

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ABSTRACT
Failure of exclusive breastfeeding still occurs due to insufficient milk production. Kenikir or Cosmos Caudatus has active compounds that may increase breast milk, but there has been no further research on kenikir in breast milk production. Analyzing the effectiveness of kenikir extract in increasing prolactin hormone levels in puerperal mothers. This type of research is a true experiment with pretest posttest control group design. The independent variable is nikir extract. The dependent variable is the hormone prolactin. The sample of 40 postpartum mothers was divided into 20 mothers in the control group and 20 mothers in the intervention group. The analysis used the Paired T Test and Wilcoxon to determine the differences before and after the intervention in each group. Then Mann Whitney's analysis was carried out on differences between groups. Administration of 300 mg of kenikir extract for 14 days can increase the hormone prolactin with an average of 44.70 ng / ml p value 0.0001. Giving kenikir extract is effective in increasing the hormone prolactin in postpartum mothers.

KEYWORDS
Kenikir, postpartum mothers, prolactin hormone

INTRODUCTION
Breast Milk (ASI) is a fluid that results from the secretion of a mother's mammary glands due to the influence of the working mechanisms of two main hormones in the body, namely prolactin and oxytocin, following the birth of a baby. ASI is an ideal food for infants because it is safe, clean, contains the necessary nutrients for the baby, and contains antibodies that help protect the baby from
various diseases (Lawrence & Lawrence, 2021). Infants should be exclusively breastfed, meaning they are given only breast milk without any additional food or drinks, except for medicine and vitamins, for the first 6 months of their life (Organization, 2017). According to UNICEF data (cited in Pujiastuti et al., 2022), the exclusive breastfeeding rate for infants under 6 months is 41%. Meanwhile, the WHO targets achieving an exclusive breastfeeding rate of 50% by 2025 and 75% by 2030 (Pujiastuti et al., 2022). The World Health Organization (WHO) recommends that breastfeeding should be initiated within one hour of birth, and complementary feeding should be introduced to infants after 6 months to meet their nutritional needs, with breastfeeding continued up to the age of 2 years (Organization, 2017).

Based on a preliminary study conducted by researchers in 2020 in Semarang, it was found that out of 10 breastfeeding mothers, 4 of them had a low breast milk production volume of 0-30 cc on the first to third days after giving birth. This indicates insufficient breast milk production in breastfeeding mothers. Additionally, 4 out of 10 mothers who consumed both pharmacological and non-pharmacological lactation aids reported breast engorgement and no increase in their breast milk production. These mothers resorted to giving formula milk to their babies, with the support of their families.

Non-pharmacological methods are a relatively safe choice to increase breast milk production in breastfeeding mothers, such as those derived from plants like moringa leaves, katuk leaves, and papaya leaves. They all contain flavonoids, with the main component being stigmasterol, which can enhance breast milk production, as shown in a study conducted by Pujiastuti et al. in Semarang, where moringa leaf biscuits were given to increase breast milk production. The results showed an increase in infant weight in the intervention group that received moringa leaf biscuits compared to the control group (Pujiastuti et al., 2022).

In recent times, another flavonoid compound, quercetin, has been researched and proven to enhance breast milk production, as demonstrated in a study by Tušimová et al., (2017) on the effects of quercetin on the endocrine system of rabbits in vivo, and a study by Ikhlasiah (2020) on infant weight gain in mothers who consumed papaya leaves, with quercetin being one of the components (Ikhlasiah et al., 2020).

One plant with a significant quercetin content in its flavonoids is the cosmos caudatus kunth plant, also known as "kenikir," compared to other plants (Andarwulan et al., 2010). However, there has been no further research on the effects of kenikir on breast milk production. Based on the background outlined above, the researchers aim to conduct a study on the "Effectiveness of Kenikir Extract on Prolactin Hormone in Postpartum Mothers."

RESEARCH METHOD

This study employs a quantitative method, and its research type is a true experiment. In the experimental group, standard therapy and 300 mg of kenikir extract were administered for 14 days, while the control group received standard therapy and a placebo. The research was conducted in Semarang from March to May 2023, with the target population being all postpartum mothers breastfeeding.
their infants. A total of 40 postpartum mothers were selected as the sample, divided into 20 in the control group and 20 in the intervention group. The allocation of the sample into experimental and control groups was done through simple random sampling (Jayadeepa, 2011). The researchers then drew lots from envelopes containing numbers 1-40. The results of this stage determined that respondents with odd numbers were placed in the experimental group, while those with even numbers were placed in the control group.

Each respondent underwent a pretest measurement of prolactin hormone levels before the treatment and a posttest measurement of prolactin hormone levels after the 14th day. The measurement of prolactin hormone levels was conducted at the GAKI Laboratory at Diponegoro University. This study has obtained Ethical Clearance from Dr. Amino Gondohutomo Psychiatric Hospital with clearance number 420/4155.

RESULT AND DISCUSSION

1. Characteristics of Respondents

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Group</th>
<th>Mean±SD</th>
<th>p Value</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>29±4,702</td>
<td>29,85±4,614</td>
<td>0,567a</td>
<td></td>
</tr>
<tr>
<td>Paritas</td>
<td>2,28±0,960</td>
<td>1,50±0,506</td>
<td>0,462b</td>
<td></td>
</tr>
<tr>
<td>IMT</td>
<td>24,750±4,490</td>
<td>26,717±4,904</td>
<td>0,194a</td>
<td></td>
</tr>
<tr>
<td>Nutrition</td>
<td>112,70±11,499</td>
<td>104,60±11,376</td>
<td>0,778a</td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 1.1 the p value for the difference test between groups with the Independent T Test obtained an age score p value = 0.567, the BMI has a p value score = 0.194, and nutrition has a p value score = 0.778. The parity characteristics tested with Mann Whitney have a p value = 0.462. These four characteristics have a p value of > 0.05 so that it can be said that there is no difference in the characteristics of respondents between intervention and control groups.

2. Up to the hormone prolactin

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>p Value</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hormone Prolactin Before</td>
<td>152,40±57,471</td>
<td>157,75±53,903</td>
<td>0,626a</td>
</tr>
</tbody>
</table>

http://eduvest.greenvest.co.id
After 197.10±66.884 139.05±51.366 0.002
Mean 44.70±46.429 -18.70±62.490 0.0001
p value 0.0001b 0.094c

Table 1.2 shows that the mean prolactin hormone in the intervention group before treatment was 152.40 ng/ml and after treatment was 197.10 ng/ml. The results of the test were different before and after treatment in the intervention group with the Paired T-Test obtained a p value of 0.0001 (<0.05) which means that there was a significant difference in prolactin hormone levels before and after treatment in the intervention group.

In the control group, the average level of the hormone prolactin before treatment was 157.75 ng / ml and after treatment was 139.05 ng / ml. The results of the different tests before and after treatment in the intervention group using the Wilcoxon difference test obtained p value results of 0.094 (>0.05) which means that there was no difference in prolactin hormone levels before and after treatment in the control group.

Analysis of the difference in prolactin hormone levels in the control group and intervention group using Mann Whitney and obtained p value results of 0.0001 (<0.05) which means there are significant differences in hormone levels before and after treatment between groups.

The effect size of kenikir extract on the hormone prolactin compared to placebo was 1.152 which showed that giving kenikir extract was effective for increasing the hormone prolactin in puerperal mothers. The average change in the hormone prolactin in both groups can be seen in Diagram 1.1 below.

![Diagram Hormon Prolaktin](image-url)

**Diagram 1. Changes in Average Prolactin Hormone Levels**
Kenikir extract contains flavonoids, quercetin, saponins, and alkaloids, which have an influence on increasing prolactin hormone levels. This research is in line with a study conducted by Prahesti and Sholihah in 2020, which investigated the use of torbangun leaf tea to boost prolactin hormone and breast milk production. Torbangun leaves are known to have polyphenols, tannins, and alkaloids that can enhance breast milk production, as well as flavonoids that can increase prolactin levels. The intervention group given torbangun leaf tea had an average prolactin level of 193 ng/ml, compared to the control group with an average of 175 ng/ml (Prahesti et al., 2020).

Kenikir extract also has a relatively high content of quercetin. Quercetin is an active flavonoid compound that acts as a natural galactagogue and is known to increase prolactin hormone levels (Jayadeepa, 2011). This aligns with research conducted by Tusimova, which administered quercetin at doses of 10, 100, and 1000 μg/kg three times a week for 30 days to the endocrine system of rabbits in vivo. The results showed that the administration of quercetin at 100 μg/kg and 1000 μg/kg three times a week for 30 days increased the levels of FSH, LH, and prolactin (Tusimova, 2017).

In the control group, the average difference between pre-treatment and post-treatment prolactin levels was -11.70 ng/ml, which means that prolactin levels in the control group decreased. Several factors can contribute to the decline in prolactin levels, including sleep patterns, suboptimal breastfeeding practices, smoking, and stress. Smoking mothers were excluded and included in the sample exclusion criteria, so the smoking factor can be disregarded. Suboptimal breastfeeding practices may be attributed to inadequate breast emptying because the baby only consumes 67% of the total available breast milk and nurses based on preference rather than waiting for the breast to be empty (Kent, 2007). It is possible that after breastfeeding, some mothers do not pump their breast milk until it is empty. Suboptimal breastfeeding practices can also be due to the use of formula milk, which reduces the frequency of breastfeeding. This can lead to a reduction in prolactin hormone levels in the blood (Hill et al., 1999). Mothers who lack sleep can also reduce prolactin levels, as selective paradoxes induce a decrease in estradiol concentration and an increase in progesterone concentration, where an increase in progesterone will also lower prolactin levels (Pires et al., 2010). Stress and mood can also influence prolactin hormone levels. Other research indicates that working breastfeeding mothers have a higher stress burden compared to non-working breastfeeding mothers, where stress can disrupt the mother's endocrine profile. Working breastfeeding mothers have lower prolactin hormone levels than non-working breastfeeding mothers. Working breastfeeding mothers also have negative moods, which are associated with low prolactin hormone levels (Bibi et al., 2021). Some respondents reported experiencing stress within their household, such as pressure from in-laws, but the researchers did not investigate this to confirm whether the stress factor directly affected the mother's prolactin hormone levels.
CONCLUSION

Administration of kenikir extract dose of 300 mg for 14 days can increase the hormone prolactin on average 44.70 ng / ml with sig value. (p value) = 0.0001 (<0.05), while in the control group experienced an average decrease in the hormone prolactin by -18.70 ng / ml, meaning that the administration of kenikir extract effectively increased the hormone prolactin in puerperal mothers. Researchers suggest that they can further conduct research on kenikir for the hormone prolactin with conversion in the daily diet, as well as add other factors that can affect the hormone prolactin such as stress, sleep patterns, and breastfeeding patterns.

REFERENCES


