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# Assessment of Tummy Time Feeding on Fumbling and Plagiocephaly Head Shape in Infants

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## ABSTRACT

**Introduction:** *Tummy time* is a form of physical activity recommended for infants less than 6 months of age that involves lying prone while awake on the floor, supervised by an adult. Regurgitation is a form of gastroesophageal reflux in infants where milk that has been swallowed comes out involuntarily. *Plagiocephaly* is an asymmetrical skull deformity caused by various factors that can be prevented to avoid aesthetic consequences. The purpose of this study was to determine the study of giving *tummy time* to spit up and *plagiocephaly* head shape. **Methods:** *Cross-sectional study* with survey method. **Results:** The results of data analysis of the spearman test used to test the relationship between *tummy time* on *plagiocephaly* head shape, there is a sig value. -0.889, in the *chi square* test to test the relationship of spitting up found asymp sig. 0.287 so there is no relationship. While the regression test showed that *tummy time* had an effect of 72.7% on the frequency of spitting up. **Conclusion:** There is no relationship between the provision of *tummy time* on infants' *spitting* up and *plagiocephaly* head shape, however, there is an effect on reducing the frequency of spitting up.

***Keywords***: *Tummy Time, Gumoh, Plagiocephaly Head Shape*

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## INTRODUCTION

The baby's growth and development period is very important, especially from the fetal period in the womb to 2 years. This period is a very important time as well as vulnerable to the development of the baby. Proper stimulation can stimulate the baby's brain so that the development of the baby's abilities becomes optimal (Tama & Handayani, 2021). *Tummy time* is a form of physical activity recommended for infants less than 6 months of age by performing a prone position while awake on the floor that is recommended and supervised by an adult. A study published in 2019 in *Child's Nervous System* found a prevalence of 25% among 165 children aged 1 month to 18 years. The highest prevalence (40.5%) was found in infants aged 1 month to 1 year, and this rate decreases with age, although some cases persist into adolescence (Di Rocco et al., 2019). According to the Ministry of Health (2022), the implementation of *tummy time* is recommended to be done 2 to 3 times a day with a duration of 3 to 5 minutes. The baby is placed on a flat surface. *Tummy time exercise* can be given since the baby is 0 months old. *Tummy time* exercise is an exercise that involves the accumulation of body weight by placing the baby in a *prone lying* position to support active neck movement, by stimulating the baby to raise his head to see the surrounding environment. The motor ability to lift the head is the basis of the first motor skills that are important for further development. (Widodo et al., 2018).

Gumoh (regurgitation) is included in gastroesophageal reflux in infants where the milk that has been swallowed is released involuntarily. The limitation of regurgitation is naturally especially in the range of the first 6 months which



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occurs due to the work of the rudimentary valve when closing and opening on the path between the stomach and oesophagus. (Widodo et al., 2023).

Plagiocephaly is an asymmetrical skull deformity caused by various factors that can be prevented to avoid aesthetic consequences (Inchingolo et al., 2022). In a study by Pediatrics & Child Health (2018), plagiocephaly was reported in 25% of infants aged between 0 and 6 months. In infants older than 6 months, the prevalence decreases to less than 10% as the infants have better movement abilities. Plagiocephaly is categorised into 3 groups: severe plagiocephaly, moderate plagiocephaly, and mild plagiocephaly.

## METHODS

This type of research is a *cross-sectional study* with a survey method which is a study describing the effect of a treatment or *treatment* as an independent variable on the results of treatment as a dependent variable (Effendi, 2013). This research has an ethical certificate with number No.763/KEPK-FIK/XII/2024. The research location is Senden Village, Colomadu, Karanganyar, Central Java.

*Tummy time* is an activity recommended for babies from an early age, usually starting around two weeks after birth. This activity, which involves placing the infant on the tummy on a flat, firm surface, such as a carpet or mat, plays an important role in supporting the infant's physical and motor development. (Sihura et al., 2023).

*Plagiocephaly* occurs in infants who consistently prefer to position the head to one side, usually those with congenital muscular torticollis. However, the frontal bulge never equals the level of occipital flattening, resulting in a more trapezoidal shape. Asymmetric head growth is often accompanied by facial asymmetry, specifically anterior displacement of the forehead, ears and ipsilateral cheeks (Rogers, 2011). The use of *Cranial Vault Assymetrical Index* (CVAI) to assess the severity of plagiocephaly was determined based on the following criteria based on previous reports: normal, CVA <5 mm or CVAI <3.5%; *mild*, 5-10 mm or 3.5%-6%; *moderate*, >10-≤15 mm or >6%-≤10%; and *severe*, >15 mm or >10% (Kim et al., 2024).

Regurgitation is a common condition that is often experienced by babies, but if it occurs excessively and is not addressed, it can cause complications and interfere with the baby's growth. Regurgitation occurs because the baby's digestive system is not yet fully mature. The muscles in the oesophagus, the tube that connects the oesophagus to the stomach, are not yet functioning optimally to close completely. As a result, stomach contents can easily rise back into the oesophagus (Ardie, 2017).

## RESULTS

The purpose of this activity is to provide education to parents and the community about the benefits of giving *tummy time to* the frequency of spitting up and *plagiocephaly* head shape. With this activity, it is hoped that there will be an increase in parents' knowledge about the importance of *tummy time* in infants that can stimulate growth and development in infants. Age division based on *head control*.

**Age and gender characteristics**

Table 1. Analysis of Respondents' Characteristics

| | Variables | Percentage |
|---|---|---|
| **Age** | 0-4 Months | 50% |
| | 5-8 Months | 0% |
| | 9-12 Months | 50% |
| **Gender** | Male | 25% |
| | Female | 75% |

Based on age, it shows that in the treatment group aged 0-4 months there are 2 people, and aged 9-12 people are 2 people. Then for female gender, there were 3 with a percentage of 75%.



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**Characterisation of measurement values of CVAI, *tummy time,* fumbling**

Table 2. Measurement of CVAI*, tummy time*, and frequency of mumbling

| | Variables | Percentage |
|---|---|---|
| **CVAI** | *Severe plagiocephaly* | 25% |
| | *Plagiocephaly Moderate* | 25% |
| | *Plagiocephaly Mild* | 50% |
| ***Tummy Time*** | Not Done | 50% |
| | Done Not Appropriate | 25% |
| | Done | 25% |
| **Gumoh** | Frequent Coughing | 25% |
| | Occasional Mumbling | 50% |
| | No Fumbling | 25% |

It was found that the results were dominated by the *mild plagiocephaly* category, the community had not performed *tummy time* according to the protocol, this also had an impact on the frequency of infant vomiting.

Table 3. Statistical Test

| **Spearman Test** | **Sig.** |
|---|---|
| *Plagiocephaly* Head Shape | -0.889 |
| **Chi Square Test** | **Asymp Sig.** |
| Frequency of Spitting Up | 0,287 |
| **Linear Regression Test** | **R** |
| Frequency of Spitting Up | 0,727 |
| *Plagiocephaly* Head Shape | 0,669 |

In the spearman test, there was a sig. value of -0.889 and in the chi-square test, the asymp sig. value was 0.287 so that there was no relationship between *tummy time* on infants' spitting up and *plagiocephaly* head shape. In the regression test, *tummy time* influenced 72.7% of the frequency of spitting up.

## DISCUSSION

The prevalence of plagiocephaly from a study reached 37.8% and was more common on the right side. The risk of plagiocephaly is 3 times higher with supine sleeping position than prone sleeping position (Mawji et al., 2014).

Giving tummy time can reduce the number of infants affected by plagiocephaly. The effectiveness of the use of tummy time is revealed by research (van Vlimmeren et al., 2017) giving tummy time to infants with plagiocephaly detected at 7 weeks of age can improve head deformities at 6-12 months of age. Then another study also mentioned that the use of tummy time for 1 year can routinely improve head deformity in infants (Watt et al., 2022). However, research on the effect of tummy time on plagiocephaly shows mixed results.

Some studies suggest that tummy time may prevent plagiocephaly as this position helps relieve pressure from the back of the baby's head caused by sleeping on the back. However, there are also studies that show that the effect of tummy time on plagiocephaly has not been fully significant in some cases (Hewit et al., 2020). From the results of the above studies, it was found that infants who have been given tummy time can still experience plagiocephaly head shape. This can occur due to several reasons such as lying in bed more often for a long time, often being carried in only one position, the form of bedding used, and giving tummy time that is not according to the recommended time. The recommended length of tummy time may vary depending on the age of the baby

Tummy time in infants 1-3 months starts with a few sessions every day, about 2-5 minutes, done with 3 sessions per day (van Vlimmeren et al., 2017). According to research (Hewitt et al., 2020) the protocol can be done on a flat and smooth place or using a semicircular pillow right in the axilla area and the baby's arms forward. In infants aged 3-6 months increase the duration to about 10-15 minutes at a time, several times a day and as a natural part of daily activities (Ramadhania & Sriwenda, 2022). Provide tummy time on a safe and comfortable surface, such as a clean, soft floor. Can be done for 30 minutes (Aarnivala et al., 2015).

According to the Indonesian Ministry of Health (2010), regurgitation in infants occurs in 70% of infants under 6 months of age, with a frequency of at least once every day. The



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incidence tends to decrease as infants age, reaching around 8-10% in infants aged 9-12 months. Some of the risk factors that contribute to the incidence of GER (Gastroesophageal Reflux) include immaturity of the gastric valve, intolerance to formula, early complementary feeding, and congenital presence. (Nariswari, 2022).

The results of the above study found that there was no association between the provision of tummy time and spitting up. The intervention influences the frequency of spitting up by increasing the strength of the abdominal muscles and diaphragm and may help improve gastrointestinal function. However, supervision is needed to prevent excessive abdominal pressure during tummy time which may trigger the occurrence of spitting up (Inamdar et al., 2024).

According to (Inamdar et al., 2024) the provision of interventions has not fully helped to reduce the risk of vomiting which can occur due to several reasons such as the provision of interventions that are not in accordance with the recommendations and several other factors such as social culture, economy, and education.

## CONCLUSION

From the results of the above studies, it has not been found that there is a relationship between the provision of *tummy time* on the frequency of vomiting and *plagiocephaly* head shape in infants. In this study there are several findings including, the provision of *tummy time* that is not as recommended, the influence of bedding, and the length of time the baby is in one position only when sleeping or when being carried.

## ADVICE

Suggestions that researchers can give for further studies are to pay more attention to the reflexes that exist in infants, be more specific with regard to the duration of vomiting, and increase the number of respondents involved.

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