

HONEY AS COMPLEMENTARY THERAPY FOR CHILDREN'S CANCER WITH SLEEP DISORDER

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Abstract

Children and adolescent cancer patients who are hospitalized for chemotherapy often have sleep problems that can negatively affect the healing process of the disease. Honey as a Complementary can be a choice of nursing interventions in order to cope problem of sleep in children with cancer. This study aimed to identify the effect of honey on the sleep quality of children with cancer who had sleep problems. Design of this study used quasi-experimental pretest-posttest design with 15 respondents who were taken by consecutive sampling. Results of data analysis using the paired t test showed differences in frequency score up at night were significantly before and after honey intervention ($p < 0.000$; 95% CI 2.52 to 2.61), there are differences in sleep onset meaningfully scores before and after giving honey ($p < 0.000$; 95% CI 23.19 to 17.47), and there are differences in the duration of sleep are meaningfully score before and after giving honey ($p < 0.000$; 95% CI 1.60 to 2.26). Researchers recommend to give honey before sleep time to improve sleep quality of children with cancer.

Keywords: Children, cancers, honey, sleep.

1. PRELIMINARY

Children and adolescents who are treated in hospital for chemotherapy often have sleep problems that can negatively affect the healing process of the disease. Sleep problems in children cancer treated in hospital can cause fatigue, decreased of the factors that can lead to decreased immune function, anorexia, difficulty concentrating and slowing physical healing. Some sleep quality of children cancer treated in the hospital of which are characteristics of the disease, treatment factors, environmental characteristics, and changes in activity levels in patients (Hinds, Pamela & Marilyn Hockenberry, 2007).

Sleep disorder (Sleep disorder / disturbance) is a disorder that causes disturbed sleep which include the inability to sleep, inability to return to sleep after waking and often wake up at night (Bruni & Novelli, 2010). Sleep has a restorative function for children and adolescents because it provides periods of increased protein synthesis, improved cell function, and the release of growth hormones that contribute to tissue renewal. The bed also gives energy conservation after children doing daily activities. Children who are cared for in the treatment room common sleep disorder 20-25% (Hinds, Pamela & Marilyn Hockenberry, 2007). Child and adolescents with cancer receiving chemotherapy had worse sleep quality compared with healthy children. Children with Acute Lymphoblastic Leukemia (ALL) 87% experienced sleep disturbances in the maintenance phase of chemotherapy (Owens, 2011). 26-40% of children who get cancer therapy experience pain of moderate to severe pain, and children who experienced pain indicates a problem of sleep disorders (Gedaly-Duff, et al, 2006).

Sleep has a restorative function for children and adolescents because it provides periods of increased protein synthesis, improved cell function, and the release of growth hormones that contribute to tissue renewal. The bed also gives energy conservation after children perform activities of daily living (Hinds, Pamela & Marilyn Hockenberry, 2007). Children and adolescents with cancer receiving chemotherapy had worse sleep quality significantly compared with healthy children and adolescents. Children with Acute Lymphoblastic Leukemia (ALL) 87% experienced sleep disturbances in the maintenance phase of chemotherapy (Owens, 2011).

Complementary therapies with honey treatment may be a choice of nursing interventions that can be implemented to the problem of sleep disorders in children to cancer. According to Altman (2010) honey can be used to improve the quality of sleep through the mechanism of Honey-

Insulin-Melatonin Cycle. Sutcliffe (2010) says that treatment with honey is the most effective for all outcomes associated with coughing, sleeping child and the parents' bed.

2. METHOD

The research design was quasi experimental with pretest posttest design approach. The selection of respondents is done with consecutive sampling technique. Criteria for inclusion in this study were: (1) Children with cancer who were hospitalized, (2) children aged 6-18 years (3) Children experiencing sleep problems, (5) Parents or guardians may be invited to cooperate and agree to his son becoming respondent. While the criteria for exclusion were children with cancer who experience worsening condition and requires treatment in the intensive care unit. Measurement of the child's sleep pattern is done by using the instrument "BEARS" (Bedtime issues, Excessive Daytime Sleepiness, Night Awakenings, Regularity and Duration of Sleep, Snoring) questionnaire interviews to parents and children. An analysis of the problem of sleep disorders is done by identifying the time it takes a child to fall asleep, number of awakenings during the night, the duration of sleep at night, the identification of whether the children is difficult to wake up in the morning and more sleep during the day and the presence of respiratory disorders when children sleep, the child said to experience sleep disturbances if it takes more than 30 minutes and underwent more than three times waking up at night (Gedaly-Duff, et al, 2006).

3. RESULT

This study identified several characteristics of respondents, age of children with cancer with sleep problems ranging from 8 to 15 years. The majority of the male sex (68.5%), type of cancer: leukemia (46.6%), Osteosarcoma (20%), Retinoblastoma (20%), Rabdomyosarcoma (13.3%).

Table 1. Results frequency score up at night before and after intervention

Variabel	Mean 0 s.d	Paired Difference (s.d)	Mean Difference (CI 95%)	p value
Frequency up before the intervention	4,06 (0,26)	2,26 (0,45)	2,52- 2,01	0.000
Frequency up after the intervention	1,80 (0,17)			

Table 1 shows that there were significant differences between the frequency score up at night before and after the intervention, in which scores the frequency of waking up at night were significantly lower after intervention honey treatment (p0.000)

Table 2. Results of scores duration of sleep before and after intervention

Variabel	Mean 0 s.d	Paired Difference (s.d)	Mean Difference (CI 95%)	p value
Duration of sleep before intervention	7,80 (1,01)	1,93 (0,59)	1,60- 2,26	0.000
Duration of sleep after intervention	9,73 (0,70)			

From table 2 it can be seen that there is a significant difference between sleep duration score before and after the intervention, in which scores of sleep duration was significantly higher after intervention honey treatment (p0.000).

Table 3. Results sleep onset scores before and after intervention

Variabel	Mean s.d	Paired Difference (s.d)	Mean Difference (CI 95%)	p value
Sleep onset before intervention	42,00 (1,52)	20,3 (5,16)	23,19 - 17,47	0.000
Sleep onset after intervention	21,60 (1,51)			

From Table 3 it can be seen that there is a significant difference between sleep onset scores before and after the intervention, in which scores of lower sleep onset significant after intervention honey treatment (p 0.000)

4. DISCUSSION

The results of the identification of sleep problems in that a majority of respondents experienced sleep pattern disturbance (86.6%). Penyebab respondents include disruption of sleep patterns are disturbed by the activities of nurses and doctors who perform actions such as the provision of drugs to patients, physical examination, checking vital signs, blood sampling and infusion, pain with a scale between 4-6, their physical discomfort in the form of fever and night due to nightmares. Kids often waking to urinate at night is also a cause disruption of sleep patterns respondents.

According to Hinds, Pamela Hockenberry and Marilyn (2007) some of the factors that can lead to decreased quality of sleep of children cancer treated in the hospital of which are characteristics of the disease, treatment factors, environmental characteristics, and changes in activity levels in patients. According to the National Cancer Institute (2010) say that environmental factors such as temperature and noise can affect oncology patients, maintenance actions that can not be predicted also affect the comfort of the patient.

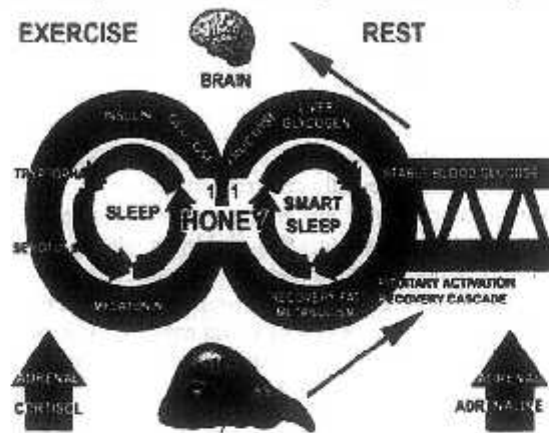
Evaluation of sleep patterns of respondents using instruments BEARS (Bedtime issues, Excessive Daytime Sleepiness, Night Awakenings, Regularity and Duration of Sleep, Snoring) indicates when the pretest to 80% of children has decreased the amount of time it takes to fall asleep, 87% there is an increased duration of sleep at night, 75% reduction in the frequency of waking up at night. 100% of respondents did not experience breathing problems during sleep. The decline in the number of hours of sleep ranges between 1-2 hours. Increased frequency of waking up at night and decreased scores duration of sleep at night caused the respondents had more sleep during the day to replace the time sleeping at night.

Sleeping during the day can reduce fatigue or stress experienced by children during nighttime sleep duration was reduced. According Friener (2014) needs a nap for the children after the age of 5 years is no longer needed, children who are too old to sleep during the day can cause sleep disturbance at night. According to the Australian Centre for Education in Sleep (2008) school-age children (6-10 years) have a need 10-11 hours of sleep, and children older adolescents (10-17 years) the required amount of sleep is 8-9 hours. Children with cancer who are undergoing chemotherapy are at great risk for experiencing insomnia and sleep-awake cycle disorders. Anxiety and depression are psychological response that can occur in children who experience sleep disturbances. Children with chronic pain are also at high risk for sleep disturbances such as increased duration of waking from sleep at night (Bruni & Lovelli, 2009).

Child and adolescent with cancer receiving chemotherapy had worse sleep quality compared with healthy children. Children with Acute Lymphoblastic Leukemia (ALL) 87% experienced sleep disturbances in the maintenance phase of chemotherapy (Owens, 2011). 26-40% of children who get cancer therapy experience pain of moderate to severe pain, and children who experienced pain indicates a problem of sleep disorders (Gedaly-Duff, et al, 2006).

The frequency's mean score of waking up at night during post-test had a direct impact on improving sleep duration score significantly. According to Altman (2012) honey can be used to improve the quality of sleep through the mechanism of Honey-Insulin-Melatonin Cycle.

Figure 1. Mechanism Honey-Insulin-Melatonin Cycle or "HYMN" Cycle. (Altman, 2012).



Metabolic cycle after consuming 1-2 tablespoons of honey before bed described by Altman (2012) are as follows:

- a. Glucose honey (partial) move from the gut, through the circulation of the liver and cause a leap in blood glucose lightly. (Glucose of honey causes only mild elevations in blood, caused the main part of sugar is fructose sugar that facilitates the absorption of glucose into the liver where it is converted into glycogen.
- b. mild elevation in blood sugar stimulates insulin from the pancreas mild expenditure.
- c. The presence of insulin in general circulation promote the secretion of tryptophan into the brain.
- d. Tryptophan is converted into serotonin, the main hormone that promotes relaxation.
- e. In the darkness, serotonin is converted into melatonin in the pineal gland.
- f. Melatonin activates sleep stimuli (by reducing the body temperature and other mechanisms).
- g. Melatonin also inhibits the release of insulin from the pancreas as "feedback" or control mechanism HYMN Cycle - thus preventing the blood sugar levels drop rapidly.
- h. melatonin stimulates the release of growth hormone which controls the body's physiological function recovery, maintain and rebuild bone, muscle and other body tissues. All this happened at night time. It is a main key for the first step in the recovery or restorative physiology that occurred during sleep.
- i. Furthermore, growth hormone begins repairing through maintenance and rebuilding bones, muscles, and other body tissues. For the "optimal recovery" it is important to supply sufficient glycogen in the liver. When liver glycogen supply is adequate glycogen reserves the physiological recovery can be optimized.
- j. Melatonin affected memory consolidation on the formation of nerve cell adhesion molecules during rapid eye movement sleep (REM). These molecules are required for the processing of short-term memory of the hippocampus and into long-term memory in the brain cortex.
- k. Concurrently with the foregoing, honey fructose part carries out its important role. Fructose is taken up by the liver where some parts are converted into glucose and stored into glycogen in the liver, thus providing a continuous supply of glucose the brain during sleep at night.
- l. In addition, fructose regulate glucose uptake into the liver by promoting the release of *glucokinase* from the nucleus of hepatocytes. *Glucokinase* found mainly in the nucleus of liver cells and is required for conversion of glucose into glycogen. The action in releasing fructose metabolism *glucokinase* is an amazing phenomenon called "The Paradox Fructose", thus, guaranteeing fructose liver with glycogen supply during the night and prevent leaps of glucose /insulin.
- m. Supply liver glycogen is enough to prevent release stress hormones cortisol and adrenaline that is due to insufficient supply of glucose to the brain.

5. CONCLUSION

Intervention of the given honey before bed to children with cancer who experienced sleep problems proved positive influence on the decline score of the waking up frequency at night, lowering the score of sleep onset and improve scores duration of sleep that can be seen from the results of statistical tests that there were significant differences mean score of waking up frequency at night, score of sleep onset and sleep duration scores before and after intervention.

The results of this study can be used as data about the effect of honey therapy improves the quality of sleep children with cancer so as to enrich the evidence base of nursing practice model for the care of children, especially children with cancer.

Benefits of the results of this study for nursing education can become foundation to provide alternative interventions to address the children's sleep problems because it has been proven effective in improve the quality of sleep of children.

The results of this study can also be input or consideration for carers to be used as part of a nursing intervention in treating children with cancer who experience sleep problems. The results of this research can help improving the knowledge of nurses in caring for children with cancer who experience sleep problems by applying the honey treatment, complementary therapies as independent nursing actions were professional and responsible so as to improve the quality of nursing care.

REFERENCE

- Altman, N. (2012). *The honey prescription*. Healing art press Rochester: Vermont.
- Ashkin, E., & Mounsey, A. (2013). A spoonful of honey helps a coughing child sleep. *The Journal of Family Practice*, 62(3), 145-147.
- Bogdanov, S. (2011). Honey as nutrient and functional food: a review. *Bee Product Science*, 3(2), 1-33.
- Bruni, O. & Novelli, L. (2009). Sleep disorder in children. *Clinical Evidence BMJ*, Vol.09.
- Cohen, H.A., Rozen, J., Kristal, H., Laks, Y., Berkovitch, M., Uziel, Y., et al. (2012). Effect of honey on nocturnal cough and sleep quality: a doubleblind, randomized placebo-controlled study. *Pediatrics*, 130(3), 1-9.
- Cohen, H.A., Rozen, J., Kristal, H., Laks, Y., Berkovitch, M., Uziel, Y., et al. (2012). Effect of honey on nocturnal cough and sleep quality: a doubleblind, randomized placebo-controlled study. *Pediatrics*, 130(3), 1-9.
- Hinds, Pamela S; Hockenberry, Marilyn; Rai, Shesh N; Zhang, Lijun; et al. (2014). Nocturnal Awakenings, Sleep Environment Interruptions, and Fatigue in Hospitalized Children With Cancer. *Oncology Nursing Society*, Vol 13, P 1-16
- Gedaly-Duff, Vivian, L., Kathryn, A., Nail, Lillian, M., Nicholson, S., Johnson, Kyle P. (2006). Pain, Sleep Disturbance, and Fatigue in Children With Leukemia and Their Parents: A Pilot Study. *Oncology Nursing Forum*, Vol 33, P. 641-651
- Klien, C. (2014). *Sleep quality*. Diakses melalui <http://www.springerreference.com/docs/html/chapterdbid/345724.html> tanggal 3 Maret 2015.
- Marwat, S.K., Khan, M.A., Rehman, F. & Khan, K.U. (2013). Medicinal uses of honey (Quranic medicine) and its bee flora from dera ismail khan district KPK Pakistan. *Pharm Set*, 26(2), 307-314.
- McInnis, M (2008). *The uniqueness of honey its impact on human metabolism and its role in restorative sleep*. First International Symposium on honey and health, Sacramento
- National Cancer Institute (NCI). Sleep disorder. Retrieved Mei 5, 2015 from www.cancer.gov/cancertopics/pdq/supportivecare/sleepdisorder/healthprofessional.
- Owen, J.A. (2011). Update in pediatric sleep medicine. *Current Opinion in Pulmonary Medicine*, Vol 17, p 425-430
- Owens, J.A & Dalzell, V. (2004). Use of the "BEARS" sleep screening tool in pediatric residents' continuity clinic: a pilot study. *Sleep Medicine*, Vol 6, p.63-69
- Australian Centre for Education in Sleep. Sleep fact. Retrieved Mei 5, 2015 from <http://www.sleepeducation.net.au/sleep%20facts.php>
- Freiner, D. Is Napping Necessary. Retrieved Mei 5, 2015 from <http://www.stlouischildrens.org/articles/wellness/napping-necessary>.