Volume. 9 Number. 1
Period: January – June 2025; page 1-12
p-ISSN : 2580-1112; e-ISSN : 2655-6669

journal homepage: https://ejournal.akperfatmawati.ac.id
DOI : 10.46749/jiko.v9i1.173

Jurnal Ilmiah Keperawatan Orthopedi (JIKO)
Article history:
Received: November 12, 2024
Revised: December 16, 2024
Accepted: December 28, 2024

Analysis of Risk Factors for Diarrhea in Children Under Two Years of Age at Koja Regional General Hospital, North Jakarta

Lina Mardianti[1], Fathiyati[2], M. Adila Rossa[3], Al-Bahra[4]

Midwifery Study Program, Salsabila College of Health Sciences, Serang – Indonesia[1.2]
Management Study Program, Muhammadiyah University of Jakarta – Indonesia[3]
Information Technology Education Study Program University of Raharja[4]
e-mail: linamardiianti@gmail.com[1], fathiyati@gmail.com[2], m.adilla_rossa@umj.ac.id[3], albahra@raharja.info[4]

Abstract

The purpose of this study was to analyze the risk factors for diarrhea in children under two years old at the Koja Regional General Hospital, North Jakarta. While the specific objective is to identify the relationship between child factors (age, sex, exclusive breastfeeding, nutritional status, measles immunization, hand and nail hygiene) and the risk of diarrhea, maternal factors (age, education, knowledge, habit of washing hands before feeding children with a risk of diarrhea, socioeconomic factors (family income) with a risk of diarrhea, and dominant risk factors for diarrhea in children under 2 years old. This study was an observational study using a retrospective case control study design. The population of this study was pediatric patients treated with diarrhea. The sampling technique used was purposive sampling. The results showed that the incidence of diarrhea had a significant relationship with nutritional status (p value = 0.037), and the habit of mothers washing hands before feeding children (p value = 0.038).

Keywords: Risk Factors; Diarrhea; Children Under 2 Years; Child Factors

Introduction

Children are a national investment because they are the nation's future generation. The quality of the nation's future is determined by the quality of its children today. Healthy children are the dream of all parents, but not all children are healthy. Health problems that occur during childhood can affect a child's growth and development, especially if the disorder affects the digestive tract, which plays a crucial role in absorbing the nutrients needed to support growth and development. One common digestive tract disorder in children is diarrhea. Diarrhea is a disease characterized by increased frequency of bowel movements (more than 3 times/day) accompanied by changes in stool consistency (to become watery), with or without blood or mucus.

Diarrheal disease is a leading cause of morbidity and mortality in children worldwide, causing 1 billion illnesses and 3-5 million deaths annually. In the United States, 20-35 million diarrheal episodes occur annually. Of these, 16.5

million children under 5 years of age suffer from diarrhea, and 400-500 diarrheal episodes result in death. According to UNICEF data, a toddler dies every 30 seconds from diarrhea.

The Health Survey found that the prevalence of diarrhea among toddlers in urban areas was 3.3% and in rural areas 3.2%, with a mortality rate of 23 per 100,000 males and 24 per 100,000 females. From this data, we can assess the potential losses if diarrhea prevention is not maximized by anticipating the risk factors that influence diarrhea in toddlers.

According to a 2005 report from the Ministry of Health, in Indonesia, every child experiences diarrhea 1.6–2 times a year. The 2007 Indonesian Demographic and Health Survey (SDKI) reported that 14 percent of toddlers had experienced diarrhea in the two weeks prior to the survey. This represents a 3 percent increase from the 11 percent found in the 2002-2003 SDKI. The highest prevalence of diarrhea occurs in children aged 6 to 35 months, which is predicted to be due to children's increased activity and increased risk of infection.

Indonesia's health profile reports that the number of cases of diarrhea in toddlers decreased from 2006 to 2009. In 2006, the outbreak occurred in 16 provinces, with cases more than double the number in 2005, with 10,980 cases and a mortality rate of 25.2% (Ministry of Health, 2006). In 2008 and 2009, diarrhea outbreaks occurred in 15 provinces, with 8,443 cases in 2008. This figure dropped to 5,756 cases and 209 deaths in 2009. This figure increased from 3,659 cases and 69 deaths in 2007 (Ministry of Health, 2009).

Statistical data obtained from medical records at the Koja Regional General Hospital (RSUD) from January to December 2019 showed that diarrhea was the third leading cause of illness after typhoid and dengue fever in hospitalized children under five. The total number of cases was 543, with 232 (42.7%) in children under one year old, and 311 (57.2%) in toddlers and preschoolers.

Children under two years old are highly susceptible to disease. Many causative and risk factors contribute to diarrhea in children, particularly in infants whose immune systems are still weak, making them susceptible to infectious diseases such as diarrhea. According to Sigmund Freud, infants are in the oral phase, where the child's satisfaction is in the mouth, so anything is put into the mouth. This makes them susceptible to infections, especially in the digestive tract. During the toddler stage, children enter the anal phase, where toilet training is introduced. Children are introduced to and taught how to properly defecate in the toilet or latrine. The habit of defecating in open areas such as ditches and the ground increases the risk of diarrhea.

During the toddler stage, children are very active and more susceptible to infectious diseases, especially those affecting the digestive tract. During this period, children experience many dietary issues. Children often become bored with home-cooked meals, leading them to purchase food or snacks from outside the home, which are not guaranteed to be hygienic.

Various studies conducted on the causes of diarrhea have concluded that the most common causes of diarrhea in children are socioeconomic factors, parental knowledge and understanding of diarrhea, handwashing before and after feeding children, an unhealthy environment, and the availability of clean water.

The high number of diarrhea cases, especially in children under 2 years of age, requires attention from all healthcare

professionals, including nurses. Nurses play a crucial role in disease prevention, particularly among pediatric and community nurses. Nurses play three roles in disease prevention: primary prevention, secondary prevention, and tertiary prevention.

Primary prevention can be achieved through health promotion efforts, such as providing health education and counseling to the community. Health education provided to parents of toddlers includes information on diarrhea prevention and the factors that can cause it, the importance of a healthy lifestyle, personal hygiene, and a healthy environment. Furthermore, children's immune systems are also strengthened through immunizations. This ensures that children do not experience recurrent episodes..

The role of nurses in secondary prevention aims to prevent the severity of the disease in sick children. For children already infected with diarrhea, nurses can provide parents with knowledge about child care during illness, providing adequate fluids to prevent complications such as dehydration, shock, and even death. Tertiary prevention efforts focus on preventing relapses or reinfection of diarrhea in children, preventing them from returning to hospital with a more severe condition. This includes providing further education on home care and management of diarrhea, as well as promoting recovery through good, balanced nutrition and the importance of a healthy lifestyle.

Based on the role of nurses discussed, it is crucial to identify risk factors for diarrhea in children. This will hopefully prevent complications from fluid loss, thereby preventing death from diarrhea. This underpins the need to analyze risk factors for diarrhea in children, especially in children under 2 years of age. The purpose of this study was to analyze the risk factors for diarrhea in children under two years of age at Koja Regional General Hospital, North Jakarta. The specific objectives were to identify the relationship between child factors (age, gender, exclusive breastfeeding, nutritional status, measles immunization, hand and nail hygiene) and the risk of diarrhea; maternal factors (age, education, knowledge, handwashing habits before feeding) and the risk of diarrhea; socioeconomic factors (family income) and the risk of diarrhea; and the dominant risk factors for diarrhea in children under two years of age.

Method

This study is an observational study using a retrospective case-control study design. The purpose of this unmatched case-control study is to examine the relationship between risk factors and diarrhea in children under 2 years of age by comparing the case group, namely children hospitalized with diarrhea, with the control group, namely children hospitalized in the Orchid Room at Koja Regional Hospital who did not suffer from or were diagnosed with diarrhea but had similar characteristics to the case group.

The population of this study was pediatric patients hospitalized with diarrhea. Data were obtained from medical records at Koja Regional Hospital. The sampling technique used in this study was purposive sampling, which is a technique for determining the sample with certain considerations according to the researcher's wishes based on previously known population characteristics or traits.

Results

1. **Characteristics of Factors Influencing Diarrhea in Children Under 2 Years of Age**

Child Characteristics

The study found that children's characteristics based on age were 32.4% more likely to be 8-11 months old than 12-18 months old. The majority of children were boys (66.7%) compared to girls. Meanwhile, based on their measles immunization history, more children had not received measles immunization (55.6%). Based on children's nutritional status, 48.1% had normal nutritional status, 25% had malnutrition, and 26.9% had severe malnutrition. Further data showed that 59.3% had clean and short hands and nails, while 40.7% had dirty and long hands and nails.

The percentage of children receiving exclusive breastfeeding was nearly the same at 52.8% and 47.2% of those not receiving it. Table 5.2 shows that the number of children receiving breast milk was higher at 78.6%. The majority of children receiving breast milk was between 3 and 6 months of age. The most common reason mothers gave for not exclusively breastfeeding their children was insufficient breast milk (18.5%).

The most common reason mothers gave for not exclusively breastfeeding their children was insufficient breast milk (18.5%). Ninety-six percent of children received drinks other than breast milk. The types of drinks given were formula milk (49.1%), water (50.9%), sugar water (3.7%), rice water (3.7%), tea (3.7%), and honey (2%). Among children not exclusively breastfed, the first complementary foods were given to them at 36.1% of children under 3 months, 24.1% at 4-5 months, and 39.8% above 6 months. The types of complementary foods given were milk porridge (32.4%), strained porridge (28.7%), fruit (18.5%), and other foods (15.7%).

Based on the frequency distribution of respondents according to maternal characteristics at risk of diarrhea in children under 2 years old, the results show that based on maternal characteristics, the majority of mothers were aged <20 and >30 years (66.7%), and 33.3% of mothers were aged between 20-30 years. Meanwhile, based on maternal education, the percentages were almost the same: 50.9% high and 53 (49.1%). Based on maternal knowledge, it can be seen that 43 (39.8%) mothers had good knowledge, 36 (33.3%) had sufficient knowledge, and 29 (26.9%) mothers had low knowledge. Meanwhile, mothers who had the habit of washing their hands before feeding their children were 63 (58.3%) always, 30 (27.8%) sometimes, and 15 (13.9%) rarely/never wash their hands. The results of the frequency distribution of respondents according to their level of knowledge based on the questionnaire at risk of diarrhea in children under 2 years old showed that out of 108 mothers, the majority answered question 5 correctly, at 88%.

Characteristics of Socioeconomic Factors and Diarrhea Incidence

Parental income level was categorized into two groups: low-income (<1 million rupiah) and high-income (>2 million rupiah). Table 5.6 shows that parents with high incomes were slightly more likely to experience diarrhea than low-income parents.

2. Relationship between Characteristics of Factors and Diarrhea Incidence in Children Aged <2 Years

Bivariate analysis was conducted to determine the relationship between each independent and dependent variable. The relationship between risk factors and diarrhea incidence was indicated by a p-value <0.05 at the 95% CI (Confidence Interval).

The results of the study on the relationship between child factors and diarrhea incidence in children aged <2 years showed that children aged 4-11

months were more likely to experience diarrhea (55.6%). Meanwhile, children aged 4-11 months were also more likely to experience diarrhea (63%). The statistical test results obtained a p-value of 0.433, concluding that there was no significant relationship between child age and the incidence of diarrhea.

The analysis of the relationship between child gender and the incidence of diarrhea revealed that children with diarrhea were more likely to be male (70.4%). Meanwhile, children without diarrhea were also more likely to be male (63%). The statistical test results obtained a p-value of 0.414, concluding that there was no significant relationship between gender and the incidence of diarrhea.

The analysis of the relationship between exclusive breastfeeding history and the incidence of diarrhea revealed that children with diarrhea were more likely to be exclusively breastfed (59.3%). Meanwhile, children without diarrhea were also more likely to be exclusively breastfed (61.1%). The statistical test results obtained a p-value of 1.0, concluding that there was no significant relationship between exclusive breastfeeding and the incidence of diarrhea.

The analysis of the relationship between children's nutritional status and the incidence of diarrhea revealed that children with diarrhea were more likely to be malnourished (35.8%). Meanwhile, 63% of children without diarrhea had normal nutritional status. The statistical test yielded a p-value of 0.009, indicating a significant relationship between nutritional status and diarrhea. The analysis also yielded an OR of 3.5, indicating that children with poor nutritional status were 3.5 times more likely to experience diarrhea than children with normal nutritional status.

The analysis of the relationship between measles immunization and diarrhea revealed that 57.4% of children with diarrhea had not received measles immunization. 53.7% of children without diarrhea had not received it. The statistical test yielded a p-value of 0.84, indicating no significant relationship between not receiving measles immunization and diarrhea.

Based on the analysis of the relationship between hand and nail condition and diarrhea incidence, it was found that children with diarrhea were more likely to have clean and short hands and nails (42.6%). Meanwhile, children without diarrhea were also more likely to have clean and short hands and nails (61.1%). The statistical test yielded a p-value of 0.84, indicating no significant relationship between hand and nail condition and diarrhea incidence.

3. Relationship between maternal factors and diarrhea incidence in children under 2 years of age

The analysis of the relationship between maternal age and diarrhea incidence revealed that children with diarrhea were more likely to have mothers aged <20 to >30 years (40.4%). Meanwhile, children without diarrhea were more likely to have mothers aged between 20 and 30 years (74.1). The statistical test yielded a p-value of 0.153, indicating no significant relationship between maternal age and diarrhea incidence. Based on the analysis of the relationship between maternal education level and diarrhea incidence, it was found that mothers with diarrhea had a higher education level, at 59.3%. Meanwhile, low maternal education levels were more common in children without diarrhea, at 57.4%. The statistical test yielded a p-value of 0.12, indicating no significant relationship between maternal education level and diarrhea incidence.

The analysis of the relationship between maternal knowledge level and diarrhea incidence revealed that children with diarrhea were more likely to have mothers with high and moderate knowledge levels, with percentages of 37% and 37%, respectively. Meanwhile, children without diarrhea also had more mothers with high knowledge levels, at 42.6%. The statistical test for low maternal knowledge levels yielded a p-value of 0.883, indicating no significant relationship between maternal knowledge level and diarrhea incidence.

The analysis of the relationship between maternal handwashing habits and diarrhea incidence revealed that children with diarrhea were more likely to have mothers who always washed their hands before feeding them (44.4%). Meanwhile, children without diarrhea were also more likely to have mothers who always washed their hands before feeding them (72.2%). The statistical test yielded a p-value of 0.05, indicating a significant relationship between maternal handwashing habits before feeding their children and diarrhea incidence. The analysis also yielded an OR of 2.43, indicating that mothers who did not have the habit of sometimes washing their hands before feeding their children were 2.43 times more likely to experience diarrhea compared to children whose mothers did have the habit of washing their hands before feeding them. The statistical test for mothers who rarely/never washed their hands yielded a p-value of 0.007, indicating a relationship between rarely/not washing their hands and diarrhea incidence, with an OR of 6.50, indicating that mothers who rarely/never washed their hands were 6.50 times more likely to experience diarrhea.

4.The Relationship Between Family Income and the Incidence of Diarrhea in Children Under 2 Years of Age

The analysis of the relationship between family income and the incidence of diarrhea revealed that children with family incomes less than 1 million rupiah were 42.6% more likely to experience diarrhea. Meanwhile, children with family incomes greater than 1 million rupiah were 61.1% more likely to experience diarrhea. The statistical test yielded a p-value of 0.845, indicating no significant relationship between family income and the incidence of diarrhea.

Discussion

1. Child's Age

The analysis of the relationship between children under 2 years of age and diarrhea incidence in this study showed a higher number of children aged 4–11 months than children aged 12–24 months. Statistical tests showed no significant relationship between toddler age and diarrhea incidence.

The 2004 Indonesian Demographic and Health Survey found that the younger the toddler, the greater the likelihood of developing diarrhea, except in the age group under six months, possibly due to infants' continued reliance on breast milk. The higher rate of diarrhea in younger toddlers is due to the lower age of the toddler, as their immune system weakens against infections, especially diarrhea, especially if the child is malnourished and lives in an inadequate environment.

In the 6–12 month age group, toddlers are typically receiving supplementary foods and, as their development progresses, are beginning to crawl, which can lead to direct contact with germs and bacteria, contamination from eating utensils, and/or food intolerances, which can increase the risk of diarrhea. In the 6-24 month age group, some breastfeeding toddlers have begun

to be weaned from their mothers and are no longer receiving breast milk. This results in a decreased immunity. This can be prevented by providing good nutrition, which will also help increase the child's immune system against exposure to infectious agents that can cause diarrhea.

2. Gender

Most of the respondents who experienced diarrhea in this study were male children. The analysis revealed no significant association between the toddler's gender and the incidence of diarrhea. However, male children were 1.39 times more likely to experience diarrhea than female children.

3. Exclusive Breastfeeding

The analysis of the relationship between breastfeeding history and diarrhea in this study found that children who were not exclusively breastfed were more likely to experience diarrhea than those who were exclusively breastfed. Statistical tests revealed no significant association between a history of exclusive breastfeeding and the incidence of diarrhea.

4. Measles Immunization

The study found that children who received measles immunizations were more likely to develop diarrhea than children who did not receive measles immunizations and children who were not yet old enough to receive them. The analysis showed no significant association between measles immunization history and the incidence of diarrhea.

The purpose of immunization is to build a child's immune system to fight various bacterial and viral infections in their environment. Therefore, with immunization, a child's body will react and develop antibodies to fight incoming antigens, including the germs that cause diarrhea.

According to previous research in toddlers, 1-7% of diarrhea cases are related to measles, and the diarrhea associated with measles is generally more severe and lasts longer. Children who had measles within the previous four weeks have a higher risk of developing severe and fatal diarrhea and dysentery. Measles immunization given at the recommended age can prevent up to 25% of diarrhea-related deaths in toddlers.

5. Nutritional Status

Diarrhea attacks occur more frequently in malnourished toddlers. The worse the child's nutritional condition, the more frequent and severe the diarrhea. It is suspected that the mucosa of malnourished individuals is highly susceptible to infection due to a weakened immune system.

The analysis of the relationship between nutritional status and diarrhea incidence in this study showed that children with poor nutritional status were more likely to experience diarrhea than children with moderate or good nutritional status. The analysis of the relationship indicated that poor nutritional status in toddlers was a statistically significant risk factor for diarrhea in children. Based on a multivariate analysis using multiple logistic regression using the enter method, the variable of child nutritional status was related to the incidence of diarrhea in toddlers.

6. Hand and Nail Condition

The study found that children with clean and short hands and nails were more likely to experience diarrhea than children with long and dirty hands and nails. The statistical test showed no significant relationship between hand and nail condition and diarrhea incidence in children.

7. Relationship Between Maternal Factors and the Risk of Diarrhea in Children <2 Years of Age

Maternal Age

Maternal age is more likely to be in the low-risk group, namely 20-30 years old. When viewed from the relationship with the incidence of diarrhea in children, maternal age is not significantly associated with the incidence of diarrhea.

Maternal Education

A person's level of education can increase their knowledge about health. One factor influencing a person's knowledge is their level of education. Education provides knowledge, which leads to positive behavioral changes. According to previous research, people with higher levels of education are more oriented towards preventive measures, more knowledgeable about health issues, and have better health status. However, the results of this study indicate that mothers with higher levels of education are more likely to have higher levels of education than mothers with lower levels of education. The analysis shows no significant relationship between maternal education and the incidence of diarrhea.

Maternal Knowledge

The analysis of the relationship between maternal knowledge and the incidence of diarrhea in this study shows that mothers with high and moderate levels of knowledge are equally likely to have higher levels of knowledge compared to mothers with low levels of knowledge. The statistical test results indicate no significant relationship between maternal knowledge and the incidence of diarrhea. The statistical test results also indicate no relationship between mothers with moderate levels of knowledge and the incidence of diarrhea. The results of the multivariate analysis showed no association between knowledge level and the incidence of diarrhea.

8.Mothers' Handwashing Habits Before Feeding Children

The analysis of the relationship between mothers' handwashing habits before feeding children and the incidence of diarrhea in this study showed that mothers who always washed their hands were more likely to do so than mothers who sometimes washed their hands or those who rarely/never washed their hands. The statistical test results indicated a relationship between mothers' handwashing habits and the incidence of diarrhea. One important hygiene behavior for mothers is washing their hands before feeding their children. Maternal handwashing practices that do not meet hygiene standards have the potential to increase the risk of diarrhea in children.

9. The Relationship Between Socioeconomic Factors and the Risk of Diarrhea in Children <2 Years of Age

The analysis of the relationship between family income and diarrhea incidence showed that children with diarrhea had a higher family income of more than 1 million rupiah compared to children with a family income of less than 1 million rupiah. Statistical tests revealed no significant relationship between family income and diarrhea incidence (p-value = 0.845).

Conclusion

The characteristics of the children who participated in the survey were that most were 8-11 months old, more were male, more were not exclusively breastfed, more had no measles immunization history, more were normal in nutritional status, and more had clean and short hands and nails. Meanwhile, maternal characteristics were mostly between 20 and 30 years old, more

mothers had higher education levels, more mothers had good knowledge, and most mothers had the habit of always washing their hands before feeding their children. Child factors related to the incidence of diarrhea are nutritional status, maternal factors related to the incidence of diarrhea are the mother's habit of washing hands before feeding the child, family income has no significant relationship to the incidence of diarrhea, of the three factors related to the incidence of diarrhea studied, maternal factors are the ones that have the greatest influence on the incidence of diarrhea in children aged <2 years at Koja Regional Hospital apart from child factors.

References

[1]. Adisasmito,W. (2007). *Faktor risiko diare pada bayi dan balita di Indonesia: Systematic review penelitian akademik di bidang kesehatan masyarakat. Makara, kesehatan*, vol. 11, no. 1, Juni 2007: 1-10.

[2]. Alam. S. (2006). *Zinc Treatment for 5 or 10 Days Is Equally Efficacious in Preventing Diarrhea in the Subsequent 3 Months among Bangladeshi Children1-4.* Februari 25,2011. http://proquest.umi.com/pqdweb?did=2266960981&sid=3&Fmt=4&client.

[3]. Alamsyah, (2002). *Hubungan perilaku hidup bersih dengan kejadian diare pada balita di Kecamatan Bangkinang Barat, Bangkinang, Kampar dan Tambang Kabupaten Kampar tahun 2002*. Maret 3, 2011. http://digilib.ui.ac.id/opac/themes/libri2/detail.

[4]. Alligood, M. R., & Tomey, A. M. (2006). *Nursing theory, utilization & application*. (3rd ed), USA : Mosby Elsevier.

[5]. Ariawan. I. (1998). *Besar dan metode sampel pada penelitian kesehatan*. Jakarta: Jurusan Biostatistik dan Kependudukan Fakultas Kesehatan Masyarakat Universitas Indonesia. Tidak dipublikasikan.

[6]. Arikunto.S. (2006). *Dasar-dasar evaluasi pendidikan*. Jakarta. Rineka Cipta

[7]. Ariyanti. M, (2009). Faktor-faktor yang berhubungan dengan kejadian diare pada anak usia 6-24 bulan di wilayah kerja puskesmas swakelola 11 ilir Palembang. Juni 21, 20011. http://uppmfkm.unsri.ac.id/uploads/files/u_2/abstrak10.doc.

[8]. Betz. Cecily L. (2002). *Keperawatan pediatrik*. Jakarta. EGC.

[9]. Clemens. (1998). *Breastfeeding and the risk of life-threatening enterotoxigenic escherichia coli diarrhea in bangladeshi infants and children*. Maret 20 Maret, 2011 http://www.pediatrics.org/cgi/content/full/100/6/e2.

[10]. Darmawan. (1008). *Gambaran faktor-faktor yang berhubungan dengan tingginya diare pada balita di kelurahan Krian, Kecamatan Krian, Kabupaten Sidoharjo (Studi kasus)*. Diunduh tanggal 5 Juni 2011 dari http://www.fk.uwks.ac.id/elib/Arsip/penelitian.

[11]. Depkes RI. (1999). *Buku ajar diare* : pegangan bagi mahasasiswa. Jakarta . Ditjen.PPM & PPL.

[12]. Depkes RI. (2002). *Profil kesehatan indonesia* 2002. Depkes RI.

[13]. Efendi & Makhfudli. (2009). *Keperawatan kesehatan komunitas: Teori dan praktik dalam*

keperawatan. Jakarta: Salemba Medika.

[14]. Fakultas Kedokteran Universitas Indonesia. (2005). *Buku kuliah ilmu kesehatan anak, buku 1*. Jakarta: Bagian ilmu kesehatan anak FKUI.

[15]. Hastomo. S. P. (2007). *Analisis data kesehatan*. Jakarta: FKM-UI

[16]. Hidayat. (2005). *Pengantar ilmu keperawatan anak 1*. Jakarta: Salemba Medika

[17]. Hira.A.M.(2002). *Analisis faktor resiko terhadap kejadian diare pada anak balita di kecamatan bantimurung tahun 2002: Analisis faktor kejadian diare*. Februari 15, 2011. http://digilib.litbang.depkes.go.id/go.php?id=jkpkppk-gdl-s2-2004-amhira-1349-diare.

[18]. Hockenberry. M & Wilson. (2009). *Wong's essensials of pediatric Nursing*. St.Louise Missouri: Mosby Essiver.

[19]. Irianto K dan Waluyo K. 2004. *Gizi dan Pola Hidup sehat, cetakan pertama*. Jakarta: Press

[20]. Juffrie. (2011). *Gastroenterologi-hepatologi, jilid 1*. Jakarta: Badan penerbit IDAI

[21]. Kamalia.D. (2005). *Hubungan pemberian asi eksklusif dengan kejadian diare pada bayi usia 1-6 bulan di wilayah kerja puskesmas kedungwuni tahun 2004/2005.* Maret 4, 2011. http://www.Scrib.com.

[22]. Kasjono.S.H, & Kristiawan.(2009). *Intisari Epidemolo*gi. Jogyakarta: Mitra Cendikia Press.

[23]. Kasman. (2003). *Faktor-faktor yang berhubungan dengan kejadian diare pada balita di puskesmas air dingin kecamatan koto tangah kota padang sumatra barat*. Mei 20, 2011 http://library.usu.ac.id.

[24]. Khalili, Gorbanali, Khalili, M, Mardani, M & Cuevas, L.E. (2006). Risk factors for hospitalization of children with diarrhea in Shahrrekord, Iran. Iranian *Journal of Clinical Infectious Diseases*, 1(3), 131-136.

[25]. Lestari. M. (2007). *Pengetahuan orang tua tentang diare pada anak yang dirawat di ruang menular RSU Dr. Soetomo*. Buletin RSU Dr. Soetomo 9(2):82.

[26]. Mandal, et all. (2008). *Penyakit Infeksi*. Jakarta: Erlangga

[27]. Mubarak & Chayatin. (2009). *Ilmu kesehatan Masyarakat: Teori dan aplikasi*. Jakarta: Salemba Medika.

[28]. Mubarak (2009). *Ilmu Kesehatan Masyarakat: Teori dan aplikasi*. Jakarta: Salemba Medika.

[29]. Mubarak. (2005). *Pengantar keperawatan komunitas 1*. Jakarta: Sagung Seto

[30]. Nelsson, W. E. (2000). *Ilmu kesehatan anak. edisi 15* (Wahab, A. S., Penerjemah). Jakarta: EGC

[31]. Ngastiah. (2005). *Perawatan anak sakit*. Jakarta: EGC

[32]. Notoatmodjo. S. (2002). *Metodologi penelitian kesehatan*. Jakarta: PT Rineka Cipta.

[33]. Notoatmodjo S. (2003). *Ilmu Kesehatan Masyarakat*. Jakarta: Rineka Cipta.

[34]. Noor. N. N. (2000). *Dasar epidemiologi*. Jakarta: Rineka cipta.

[35]. Palupi. A, (2005). *Status gizi dan hubungannya dengan kejadian diare pada anak akut di ruang rawat inap RSUP Dr. Sardjito Yogyakarta*. Jurnal Gizi Klinik Indonesia, vol.6, No. 1, Juli 2009.

[36]. Pollit,.D.F,Bek,C.T, & Hungler, B.O. (2003). *Essential of Nursing Reseach: methods apprasial and utilization, 6 th ed*. Philadelphia: Lipincott.

[37]. Pollit,.D.F,Bek,C.T, & Hungler, B.O. (2005). *Nursing reseach:*

Principle and methods..Philadelphia: Lipincott.

[38]. Rohmah, K. (2002). *Pengaruh pengganti air susu ibu (PASI) terhadap kejadian diare di poli bayi RSUD Dr. Soetomo Surabaya*. Februari 20 2011. http://digilib.litbang.depkes.go.id/go.php?id=jkpkbppk-gdl-res-2002-k2c-1893-diare..

[39]. Ruel. T. M. (1997). *Impact of zinc supplementation on morbidity from diarrhea and respiratory infections among rural guatemalan children.* Maret 10, 2011. http://www.pediatric.org/cgi/content/full/99/6/808. Diperoleh pada.

[40]. Sastroasmoro,S, & Ismael.(2002). *Dasar-dasar metodologi penelitian klinis.edisi kedua*.Jakarta: Sagung Seto.

[41]. Sender, M.A. (2005). Hubungan faktor sosio budaya dengan kejadian diare di desa Candinegoro kecamatan Wonoayu Sidoarjo. *Jurnal Medika*. Vol.2. No. 2 Juli-Desember; 163-193.

[42]. Setiadi. (2007). *Konsep dan penulisan riset keperawatan*. Yogyakarta: Graha Ilmu.

[43]. Sinthamurniwati. (2006). Faktor-faktor resiko kejadian diare akut pada balita (studi kasus di semarang). Februari 25, 2011. http://pdffactory.com.

[44]. Soebagyo B. (2008). *Diare akut pada anak.* Surakarta: Universitas Sebelas Maret

[45]. *Sondongagung, Kecamatan Godean Kabupaten Sleman Yogyakarta*,

[46]. Sugiono (2005). *Statistik untuk penelitian*. Bandung: Alfabeta.

[47]. Sugiono (2007). Metode *penelitian kuantitatif dan kualitatif.* Bandung: Alfa beta

[48]. Suharti, (1997). *Pengaruh air bersih kaitannya dengan kejadian diare di desa.* Bandung: Yrama Widya.

[49]. Sunoto. (1990). *Situasi Diare dan KLB 1991*. FKUGM: Yogyakarta.

[50]. Supartini, Y. (2004). *Buku ajar konsep dasar keperawatan anak*. Jakarta: EGC.

[51]. Suraatmaja. (2007). *Gastroenterologi anak*. Jakarta: Sagung Seto.

[52]. Tomey. A. M & Alligood. M. R. (2006). *Nursing theorists and their work*. St.Louis: Mosby,Inc

[53]. Warouw, S. P. (2002). *Hubungan faktor lingkungan dan social ekonomi dengan morbiditas (keluhan ISPA dan diare)*. Februari 15, 2011. http://digilib.litbang.depkes.go.id/go.php?id=jkpkbppk-gdl-res-2002-sonny-836-lingkungan.

[54]. Whaley & Wong's. (2000). *Essensials of pediatric nursing*. St.Louis Missouri: Mosby Company.

[55]. Widiastuti, P. (2005). *Epidemiologi suatu pengantar*, edisi 2. Jakarta; EGC.

[56]. Wilunda, C, Panza, A. (2006). Factor associated with diarrhea among children less than 5 years old in Thailand: A secondary analisis of Thailand multiple indicator cluster survey 2006. *J Health res* 2009, 23 (suppl), 17-22.

[57]. Winlar.W.(2002). *Faktor-faktor yang mempengaruhi kejadian diare pada anak 0-2 tahun di kelurahan turangga*. Februari 15, 2011. http://digilib.litbang.depkes.go.id/go.php?id=jkpkbppk.gdl.res.2002-wiwin.1723.diare.

[58]. Wong. D. L, Hockenberry. M, Wilson. D, Wikelstein. M. L, Schwartz. P. (2009). *Buku ajar keperawatan pediatrik, volume 1*. Jakarta: EGC.

[59]. Wong. D.L (2003). *Nursing care of infants and children,(7th edition), volume 2* . St.louis: Mosby.

[60]. Yalcin, S.S, Hizli, S, Yurdakok, K, & Ozmer, E. (2005). Risk factors for hospitalization in children with acut diarrhea : a case control study. The *Turkish Journal of pediatric*, 47, 339-342.

[61]. Yulisa. (2008). Faktor-faktor yang mempengaruhi kejadian diare pada anak balita (studi pada masyarakat etnis dayak kelurahan kasongan baru kecamatan kentingan hilir kabupaten Kentingan Kalimantan tengah). Fakultas Kesehatan Masyarakat Universitas Diponegoro.