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Effectiveness of short message service reminder and home care nursing to the compliance of the elderly in the provision of malaria drugs in infants

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Abstract
Globally malaria still causes high mortality rates especially in infants. In Indonesia, Papua is one of the provinces with the highest incidence and the Mimika Regency is the regency with the highest prevalence and incidence. In addition, the main problem with malaria management is the parasite resistance of P. Falsiparum and P. vivax because the treatment is not complete. The role of parents is necessary in the administration of malaria drugs in infants, to prevent repeated malaria and complications. The research aims to determine the difference in the effectiveness of Short Messege Service Reminder (SMS), Home Care Nursing (HCN), and Short Messege Service Reminder, Home Care Nursing (SMS + HCN) on parental compliance in malaria drug delivery Infants in new Mimika district Puskesmas Mimika County. This research is a quantitative study with experimental quasi design, a population of 60 respondents who had a toddler who had been diagnosed with vivax malaria divided into 2 categories namely Papua and Non-Papuans, and 10-person intervention group respectively. The results of the three interventions affect parental compliance level in the administration of malaria medication in infants where $\alpha < 0.05$ with HCN PV intervention results = 0.024 for Papua and non-Papua PV = 0.004, for SMS intervention in Papua PV = 0,014 and non-Papua PV = 0,005 and in HCN + SMS intervention on Papua PV = 0,004 and non-Papua PV = 0,023. In conclusion, HCN, SMS and HCN + SMS interventions can be used by health personnel to improve parental compliance in malaria medication in infants which can eventually increase recurring incidence and parasite inconsistency in P. vivax.

Keywords: Malaria, compliance, HCN, SMS

Introduction

The Indonesian health demographics Survey of 2017, showed a neonatal mortality rate of 15 per 1000 live births (KH), infant mortality rate 24 per 1000 KH, and infant mortality rate 32 per 1000 KH. From that data explains that the highest mortality rate is the death of infants (3.2%) (BKKBN, 2018). The death is because in childhood susceptible to an illness, it is because the immunity factor is not yet developed perfectly. In this stage toddlers are often exposed to infectious diseases such as pneumonia, tuberculosis, diarrhea, including endemic diseases such as malaria (Feigin & Cherry's, 2019) [18].

Malaria is still a global health problem because it can cause high mortality rates in all age groups, especially in toddlers (WHO 2015; Harijanto, 2018 [31]. Malaria is an infection caused by 5 species of Plasmodium (P. falciparum, P. vivax, P. Malariae, P. Ovale, and P. Knowlesi) (Poespoprodjo, 2018). The above five types have their own difficulty level, Kenangalem, *et AL*. (2019) says P. vivax is more difficult to treat than P. falciparum. Malaria is characterized by symptoms of recursive fever, anemia, and Hepatosplenomegaly (potted, 2007; Marni, 2016). In support of the Global Tekhnical Strategy for Malaria 2016-2030 (GTSM) program, the Indonesian Government is committed to the elimination of malaria in 2030 through a national program of improved access to quality malaria services and prevention and control Integrated vector with the decree of the Minister of Health (Harijanto, 2018) [31].

The WHO reports in 2015, the highest malaria occurred in the African continent as much as 214 million cases (88%), followed by South East Asia by 10%. In Indonesia, in February 2016 the National API (Annual Parasite Incidence) number is 0.85 per 1000 inhabitants, with maps endemic to population and spread in 45 districts/cities. Among the 34 provinces of the highest API number in 2016 are Papua, West Papua and East Nusa Tenggara (Harijanto, 2018) [31]. The API figures in the Papua province are recorded as 42.6 per 1,000 inhabitants. Mimika County ranks to the highest two with an API of 168 per 1000 inhabitants (Depkes, 2017; Al., 2019).

The population of Mimika County in 2018 215,493, with a age group of 0-4 years as much as 25,315 (BPSa, 2018) [15]; And populous is the new Mimika subdistrict with 50.12% or 108,005 inhabitants (BPSb, 2018) [16]; Consisting of 71533 indigenous Papuans (OAP), and 96725 non-OAP (BPS, 2010) [14] souls. According to Mimika District health Office data in 2016 there were a number of cases of malaria 51,638 cases and in 2017 as many as 81,850 cases. The Data suggests that, in the last 2 years there has been a significant increase in the number of cases of malaria. And the highest case occurs in toddlers reaching 17,647 cases (Dinkes Mimika, 2018). The new Mimika district is a district with the highest number of sufferers and suspect malaria of 17,134... % (Depkes, 2016).

One of the main factors in the occurrence of therapeutic failure is parasite resistance to Anti-Malaria drugs (OAM) (Nugroho, 2010; Pameswari, 2016; Harijanto, 2018; Kenangalem, *et al*.,

2019) [31, 54. 65]. Over the last six decades, drug resistance from Plasmodium Falciparum has been a very concern especially in Southeast Asia (Lin, Juliano & Wongsrichanalyao, 2018: Sinha, Medhi & Sehgal, 2014) [79]; Especially on this artemis(Ashley *et al*, 2014; Cerqueira, *et al*, 2017; Kenangalem, *et al*., 2019) [17]. Resistance is due to the OAM usage policy (Nugroho, 2010) [54]; Fault diagnosis, delay handling, improper dose of the drug, the quality of the drug (Harijanto, 2018) [31] and non-compliance with drugs (Nugroho, 2010; Steury, 2016; Pameswari, 2016; Harijanto, 2018) [31, 54, 82, 65]. This disobedience is caused by lack of family support (Karmila, 2016). Family support can be a healing boost, treatment information and risk of non-compliance that affects the success of treatment (Irnawati, 2016) [35]. Besides Finn's family support (2018) [29] suggests that all lines can play a role in raising non-family compliance, namely teachers, healthcare professionals.

There are several types of malaria treatment in Papua, Setyadi *et al*. (2019) states the treatment of malaria in infants with primaquine should be considered in repeated cases of malaria (Setyadi *et al*, 2019); Dihydroartemisinin-piperaquine single dose in intermittent monthly is a promising alternative to p. falciparum and P. vivax (Ahmed, *et al*, 2019); Dihydroartemisinin-Piperaquine and Artemeter-lumefantrine are safe and effective for the treatment of uncomplicated malaria multidrug. However, Dihydroartemisinin-piperaquine provides post-treatment prophylaxis larger than the Artemeter-lumefantrine, to reduce the reinfection of P falciparum and the recurrence of P vivax, (Ratcliff *et al*, 2019).

Based on preliminary study results, the efforts that have been done by health officers in the new Mimika district to improve the compliance of malaria medication in infants is by providing education to parents during the submission of prescriptions and Drug Administration by Pharmacist, make a home visit, and tour Puskesmas program. In addition to this, the effort was supported by the government. Mimika in cooperation with the Department of Public Health & Malaria Control (PHMC), PT Freeport Indonesia (PTFI), the Health Bureau of the AMUNGME and Kamoro Community Development Agency (LPMAK) through the Citra Development Foundation of Indonesia (YPCII) with Conducting educational programs for indigenous peoples in the prevention of Malarian, spraying, mosquito-sharing and routine surveys of malaria tests Meanwhile, in vector and logic control, LPMAK cooperated with PT. FI, R & D Ministry of Health and Menzies School of Health research from Australia to examine immunity to anti-malaria drugs and therapeutic efficacy Combination based on Artemisin (CCPHI, 2013). But the effort above resulted in the results evidenced by the high incidence of malaria in all age groups.

Although global morbidity and mortality has decreased substantially, malaria, parasitic infections of red blood cells, still kills approximately 2,000 people per day, most of which are children in Africa (White *ET AL*, 2014). In addition to the case of children, it can manifest the breakdown of brain physiology, deficits on cognitive functions such as memory, attention, problem solving, and motoric control (Finn, 2018) [29].

Socio-demographic factors found strongly affect the prevalence of malaria. The Factor is the knowledge of society to the availability of health facilities 4.2 times to be an incidence in Indonesian society Histirio Malaria (Hasyim *et al*, 2019) [32]. While in terms of drug compliance, Lopulalan (2016) [41], geography and knowledge of sufferers and families is the key to improving the compliance with the drug. What the Hasyim expressed and Lopulalan was expressing in accordance with the condition of the district socio-demographic. Mimika in general and the new Mimika district in particular that allows to be a high factor of malaria incidence figures.

One of the techniques for minimizing the end-of-medication number is to ensure the sufferer program and provide full support and assistance from the first time of treatment to heal (Lopulalan, 2016; Hasdon. Al (2019) [41]. Compliance with medicine is determined by the attention of health workers to provide health counseling, explanation to patients with health education (Amoran, 2013) [6]; or Home Care Nursing (Lopulalan, 2016) [41]. Home Care Nursing (HCN) is a health service conducted by professionals in the patient's residence (at home). The aim of HCN is to help meet the patient's needs in addressing health problems implemented by the healthcare team by involving the family as supporting the nursing and healing processes so that the achievement of independence Family in overcoming health problems. Besides self-reliance, HCN can also improve health services to the community comprehensively and continuously so that the needs of patients can be fulfilled and patients will be more comfortable and satisfied with nursing care (Parellangi, 2015) [60]. HCN can improve patient compliance and family activity in support of drug-taking compliance programs (Rokhman, 2015; Utaminingrum, 2017) [68, 85].

In addition to the HCN, see the geographical condition and limitation of the number of health workers then another effort is to use technology. One of the technology that can be utilized is Short Message Service (SMS). SMS can be used as a reminder of the patient and the family to take medication (Lubis, 2015; Wirawan, 2017) [42, 89]; Occurs in Zambia the use of SMS is not having a significant relationship with malaria-medication compliance (Steury, 2016) [82]. Although there are different results, researchers will try to use SMS as a reminder method. The reason researchers are in Papua especially in Mimika district geographical conditions make the signal unstable in the use of smartphones and communities in the countryside are still using ordinary mobile phones.

The purpose of this research is to know the difference in the effectiveness of SMS reminder and HCN to parents ' compliance in the administration.

2. Method of Research

This study used a quantitative research type with Quasi Experimental design. Experimental quasi with pre-test and post test without control. The population in this study amounted to 60 respondents who had toddlers with the malaria vivax. Sample collection technique using purposive sampling. The samples in this study are the parents of the children who diagnosed malaria tersiana who came to medicine in 3 health centers in the district Mimika Baru Mimika District namely Kwamki Baru Puskesmas, Puskesmas Timika Jaya and Central Market Puskesmas. A total of 60 divided into two Papuans and non-Papuans each got 3 treatments each 30. The instrument used is MMAS-8 to measure the level of parental compliance in infant drug delivery.

Criteria of inclusion of parents who have a toddler with BB > 10Kg and willing to be respondents, toddlers who have conducted

a laboratory examination of positive blood samples and diagnosed malaria Tersiana, mix Malaria (P. Falcifarum + P. vivax) and Ovale. For exclusion criteria is the toddler with data that is not downed toddlers with severe malaria, parents who are not willing to intervene, can not read and write, do not have a mobile phone and who can not speak Indonesian.

Prior to the sampling process, prospective respondents were given information about the research conducted, the benefits and possible impacts could be inflicted during the research process, if the response agreed it followed by filling the sheet Approval of respondents. In the HCN group, respondents were given education using leaflets, delivering self-contained cards and observation sheets for researchers and taking blood samples all the day to 4 and 15. Meanwhile, in the group of SMS, SMS first day by introducing themselves, and doing message delivery for 14 days and on days 3 and 14 remind for a return visit to Puskesmas by modifying the greeting sentences every day. In combination group of SMS treated every day and 3 times home visit with the same stages.

3. Result

3.1 Frequency Sosio-Demografy

Table 3.1: Distribution Frequency Sosio-demography (n=60)

Karakteristik	Frequency (n,60)					
	HCN (n total=20)		SMS (n total=20)		HCN + SMS (n=20)	
	Papua	**Non-Papua**	Papua	**Non-Papua**	Papua	**Non-Papua**
Age <20 year 21-30 year 31-40 year 41-50 year	1 (10%) 7 (70%) 2 (20%) -	- 4 (40%) 5 (50%) 1 (10%)	2 (20%) 6 (60%) 1 (10%) 1 (10%)	- 4 (40%) 4 (40%) 2 (20%)	2 (20%) 4 (40%) 2 (20%) 2 (20%)	- 4 (40%) 5 (50%) 1 (10%)
Sex Female Male	10 (10%) 0 (0%)	9 (9%) 1 (10%)	6 (60%) 4 (40%)	7 (70%) 3 (30%)	4 (40%) 6 (60%)	10 (100%) -
Work Without work Working	8 (80%) 2 (20%)	6 (60%) 4 (40%)	5 (50%) 5 (50%)	5 (50%) 5 (50%)	7 (70%) 3 (30%)	7 (70%) 3 (30%)
Education Low Education High Education	5 (50%) 5 (50%)	8 (80%) 2 (20%)	6 (60%) 4 (40%)	4 (40%) 6 (60%)	2 (20%) 8 (80%)	3 (30%) 7 (70%)
Custom	Biak 2 (20%) Damal 2 (20%) Dani 3 (30%) Mee 1 (10%) Moni 1 (10%) Serui 1 (10%)	Ambon 2(20%) Jawa 1 (10%) Key 4 (40%) Maluku 1 (10%) Toraja 2 (20%)	Amungme 2 (20%) Biak 1 (10%) Kamoro 3 (30%) Moni 1 (10%) Paniai 1 (10%) Serui 2 (20%)	Ambon 1 (10%) Jawa 1 (10%) Key 4 (40%) Maluku 1 (10%) Manado 1 (10%) Toraja 2 (20%)	Biak 1 (10%) Damal 1 (10%) Dani 3 (30%) Kamoro 1 (10%) Mee 1 (10%) Serui 2 (20%) Sorong 1 (10%)	Ambon 1 (10%) Bima 1 (10%) Key 6 (60%) Minahasa 1 (10%) Toraja 1 (10%)

In Papua the group gained that from the three groups conducted, the most age of respondents was in the age range of 21-30 years, which is 17 out of 30 respondents (56.6%). The gender is dominated by females with a total of 20 respondents (66, 6%), most of which do not work with a total of 20 respondents (66.6%), and most are educated by as many as 17 respondents (56.6%). The most people were Dani tribes of 6 respondents (20%). In the non-Papuan group seen from table 5.2. It is obtained that the most age is at the age range of 31-40 years amounting to 14 respondents (46, 6%), gender in domination by females with 26 respondents (86, 6%), most of which do not have a job of 18 respondents (60%), but to The same education between the low educated and the high is 15 respondents (50%), the most tribe is the Key tribe with the number of 14 respondents (46, 6%).

3.2 Parental compliance in malaria drug delivery in infants

3.2.1 Parental level of compliance with infant malaria medication in infants prior to intervention

Table 3.2: Overview of Papua and non-Papuan parents ' compliance levels in malaria medication in infants prior to intervention (n-60)

INTERVENTION	OBEDIENT	PAPUA	NON-PAPUA
HCN	LOW	6 (60%)	6 (60 %)
	AVERAGE	2 (20%)	4 (40%)
	HIGH	2 (20%)	0
SMS	LOW	3 (20%)	3 (30%)
	AVERAGE	5 (50%)	6 (50%)
	HIGH	2 (30%)	1 (10%)
HCN+SMS	LOW	5 (50%)	2 (20%)
	AVERAGE	5 (50%)	5 (50%)
	HIGH	0	3 (30%)

Based on the results of the 5.2 table in the Papua respondents group, it is known that from 3 groups of interventions each numbering 10 respondents were known that: in the HCN group of interventions were largely low compliance of 60%, while For SMS intervention most have moderate compliance of 50% and for HCN + SMS intervention, 2 low and moderate compliance interventions with the same percentage of 50% of 10 respondents. While in non-Papuan respondents for HCN interventions, most of them have low compliance with a percentage of 60% of the 10 respondents, SMS intervention is largely under moderate compliance of 60% and in HCN + SMS intervention most have Compliance of 50%.

3.2.2 Test normality Pretests and posttest compliance on Papua and non-Papuan tribe respondents

Table 3.3: Overview of test result normality pretests and posttest compliance on Papua and non-Papuan tribe respondents

Variable	Value *shapiro-wilk* (*p value*)
Papua respondents with home care nursing before intervention	0,001
Papua respondents with home care nursing after intervention	0,000
Group of non-Papuan respondents with home care nursing before intervention	0,000
Non-Papuan intervention group with home care nursing after intervention	0,000
Papua Intervention Group with short message service reminder before intervention	0,036
Papua Intervention Group with short message service reminder after intervention	0,000
Non-Papuan intervention group with short message service reminder before intervention	0,012
Non-Papuan intervention group with short message service reminder before intervention	0,000
Papua respondents group with home care Nursing + Short Message service reminder before intervention	0,000
Papua respondents with Home care Nursing + Short Message service reminder after intervention	0,000
Non-Papuan group of respondents with home care Nursing + Short Message service reminder before intervention	0,036
Non-Papuan group of respondents with home care Nursing + Short Message service reminder after intervention	0,000

Based on analysis of pretests and posttest data normality test in table 3.3 above, obtained from respondents of Papua and non-Papuan tribe intervention group obtained the value of P value of < 0.05 which means distribution data is abnormal so that the analysis of non-parametric data with Wilcoxon test. Test homogeneity is not carried out because of the test requirement of homogeneity that is parametric test and or normal distribution data.

3.2.3 The average compliance difference of respondents before and after intervention

Table 3.4: The average compliance difference of respondents before and after intervention (n = 10)

Variable		Respondent	
		Papua	Non-Papua
HCN	Before mean	1.60	1.40
	After mean	2.50	2.90
	Δ	0.90	1.50
	P*value*	0,024	0,004
SMS	Before mean	1.90	1.80
	After mean	2.80	2.90
	Δ	0.90	1.10
	P*value*	0,014	0.005
HCN+SMS	Before mean	1.50	2.10
	After mean	2.90	2.90
	Δ	1.40	0.80
	P*value*	0,004	0,023

According to the table above, it is known that all three interventions affect parental compliance level in malaria drug delivery to toddlers. However, in the HCN intervention of Papuan respondents has the significance value of Pvalue = 0.024 with higher increase in value compared to non-Papuan respondents with Pvalue = 0.004. This means that HCN interventions are more influential in the parental compliance level in the administration of malaria drugs in non-Papuan infants compared with non papuans, with an average increase of Δ = 1.50 after intervention. SMS intervention given to non-Papuan respondents has a smaller value with Pvalue = 0.005 compared to Papuan respondents with a value of Pvalue = 0.014. It can be concluded that the SMS intervention has a better impact on the level of compliance of non-Papuan respondents in malaria medication in infants with an average value of increased Δ = 1.10. While HCN + SMS intervention is known that the level of compliance of Papua respondents is better evidenced by the value of Pvalue = 0.004 is smaller compared to non-Papuans with a value of pvalue = 0.023. HCN + SMS Intervention has a better impact on parental compliance level in drug delivery in non-Papuan infants Δ = 1.40 The Wilcoxon Test statistic of all three interventions for Papuan and non-Papuan respondents were known to be the Pvalue's value smaller than α = < 0.05, hence the accepted hypothesis which means there is a distinction between before and after the intervention until it is concluded that the use of all third-However, in the Papua group the most influential intervention is HCN + SMS intervention with the value Pvalue = 0.004 with an average increase in the value before and after the intervention is

greater when compared with the other value Δ = 1.40. In contrast to non-Papuan respondents of the three interventions that have been conducted, it is found that the most influential intervention is better is HCN intervention with the value of Pvalue = 0.004 with an average increase in value before and after Δ

4. Discussion

4.1 Socio-Demography

Usia terbanyak pada penelitian ini adalah berada di rentang 21-30 tahun dengan jumlah 17 responden (56,6%) untuk responden papua sedangkan untuk kelompok responden non papua usia terbanyak ada pada rentang usia 31-40 tahun berjumlah 14 responden (46, 6%). Berdasarkan karakteristik usia, masa dewasa terbagi menjadi beberapa fase. Usia 21-30 termasuk dalam fase dewasa awal dimana secara biologis telah siap dalam perawatan anak sedangkan secara psikologis peralihan peran dan tanggung jawab dan kurangnya pengalaman menjadi alasan terhadap kurangnya kepatuhan sedangkan 31-40 tahun merupakan periode dewasa dimana kematangan secara biologis dan psikologis dan juga banyaknya pengalaman dapat menentukan dalam mengambil keputusan dalam perawatan anak sehingga menunjang dalam kepatuhan dalam pemberian obat terhadap balita. Fauzi (2018) [26] yang menyatakan bahwa usia berpengaruh dalam kepatuhan pasien..

The most age in the study was in the 21-30 year range with a total of 17 respondents (56.6%) For Papuan respondents and for groups of non-Papuan respondents the most age ranges from 31-40 years of age amounted to 14 respondents (46, 6%). Based on age characteristics, adulthood is divided into several phases. Ages 21-30 are included in the early adult phase where biologically prepared for child care while psychologically shifting roles and responsibilities and lack of experience are the reasons for lack of compliance while 31-40 years is an adult period where the biological and psychological maturity and also the number of experiences can determine in making a decision in the child care so as to support in obedience in the delivery of drugs to toddlers. Fauzi (2018) [26] stating that age is influential in the patient's compliance. However, it was not in line with the study that was done by Dewi (2015) [42] stating that, there is no significant relationship between the ages, with the adherence to taking medication with the value of Pvalue = 0.060

The gender of respondents in this study for Papuan and non-Papuan groups was dominated by women. Where for Papua with 20 respondents (66, 6%) and non-Papuans with a total of 26 respondents (86, 6%). The female gender affects the observance of treatment (Onyango *et al*, 201; Fauzi, 2018) [26, 58]; The husband does not support the treatment process (Dierickx *et al*, 2016) [23]. Women's role is vital in childcare so that it can be influential in the continuity of growth for children (Fauzi, 2018) [26].

The study found that respondents were largely highly educated. What is found according to what Onyango et finds. Al (2012), [58] That education only affects accessibility on drugs. Unlike those found by the Kemenkes (2013); Siswanto, Yanwirasti and Usman (2015) [80] who found an educational relationship with obedience to medication

Most of the respondents in this study did not work. Papua Group with a total of 20 respondents (66.6%) and non-Papuans as much as 18 respondents (60%). Fauzi (2018) [26] is included in the type of intentional non-compliance (Intentional Nonadherence) where this behavior usually reflects a rational decision making process in the involvement of decision making. Absence of work is one of the factors that can influence decision making to the health workforce. Dewi (2015) [42] also stated in her research that, there is no link between income by obedience to medication in lung TUBERCULOSIS (Pvalue = 0,392),

Respondents in this study had a wide variety of tribes. Papua is one of the provinces in Indonesia that has the most tribes. Mimika District is the research site of the indigenous Papuans in the districts of Mimika consisting of Kamoro, Amungme, Dani, Damal, Moni, Me, Nduga. Likewise, non-Papuan tribes in Mimika district are diverse. Mimika District is one of the cities in Papua that is tropical climate where it is endemic to malaria. Residents since birth have been infected with parasite malaria so that it can obtain degrees of immunity is rather high

Research Dierickx *et al* (2016) [23] in the Gambia, Africa finds that affecting adherence to malaria disease in the context of the social-demographic is their local belief in illness, misunderstandings of the treatment process that they believe After the body has started to recover as before, the Pengobatannyapun stopped and the decision of the husband who does not support the healing process. What is found Dierickx *et al* is similar as it does in the research area. Meanwhile, Nugraheni (2017) emphasized that the length of living in Papua can affect obedience.

4.1 Effectiveness of HCN interventions on parental compliance in malaria drug delivery in infants

The HCN intervention in Papuan respondents there was an increase in the average compliance value from before and after the intervention with the value of Δ = 0.90 (Pvalue = 0,024) while in non-Papuan group there was an average increase in value before and after Given the intervention of Δ = 1.50 (Pvalue = 0,004) So it can be concluded that HCN is more influential in the level of compliance of non-Papuan parents in malaria medication to children. Increased compliance with non-Papuan respondents was affected by HCN services that were different than before. Before HCN is done, parents must go to their own healthcare services that should use the cost and time but instead, this time the respondents feel facilitated because blood sampling is done at home, reminded and always educated the importance of adherence to drug Administration.

The cause of disobedience in malaria treatment is less obvious instruction and often the health force does not control/supervise the patient in consuming the drug; Beer *et al* (2009) [12]; More than half of those who get a malaria treatment prescription do not take the recommended dose (Onyango *et al*, 2012) [58]. Therefore, Parellangi (2015) [60] stated that the role of nurses in the Ministry of HCN is very large where nurses act as Patient educator that is the nurse in conducting visits to patients usually performed on a part-time basis or within a certain period, so that direct contact time with the patient is limited. Aziz, Palu, Aril Ahri (2018) [3] states that the quality of HCN services affects patient satisfaction, and the quality of HCN services affects patient confidence, and patient satisfaction affects the patient's trust.

4.2. Effectiveness of SMS intervention on parental compliance in malaria drug delivery in infants

In the Papua group increased the value of Δ = 0.90 (Pvalue = 0,014) while in non-Papua with an average increase before and after the Δ intervention = 1.10 (Pvalue = 0.005). From that data it can be concluded that SMS intervention has the effect of increasing adherence to Papuan and non-Papuan respondents but is more impactful in non-Papuan groups where non-Papuan groups are smaller (Pvalue = 0,005) than Papuan respondents. What is found above that treatment with medication can be increased by reminding the patient and/or the family (goddess, 2016); Family Support (Karmila, Lestari and Herawati, 2016); specifically the support of the husband as head of the family (Onyango *et al*, 2012) [58]; and depends on the socio-Democrafi (Dierickx *et al* 2016) [23]. What is expressed Dierickx *et al* specifically emphasized that it will be different habits in the community (tribe) in terms of decision making, how to carry out their daily lives.

4.3 Effectiveness of HCN + SMS interventions on parental compliance in malaria drug delivery in infants

On average Papuan respondents increased compliance in providing malaria medication in infants is Δ = 1.40 (Pvalue = 0.004) while in non-Papua the average increase in compliance in giving malaria medication to toddlers Δ = 0.80 (Pvalue = 0.023). HCN + SMS Interventions provide a more effective influence to increase adherence to parents in providing malaria medication to infants in Papua, this is influenced by several factors, among which most respondents have Higher education and does not work so it can support for compliance with parents. But this is different from non-Papuan groups that mostly have low educational background and working mothers. This affects the poor level of parental compliance. High compliance is also influenced by the use of modern measuring methods using MMAS-8 which is a high validity questionnaire.

However, the accuracy of the MMAS-8 can be an unobjective assessment of which respondents can subjective themselves and give value to themselves. It can also easily provide an answer that does not match what is done. For that in support of better results is required modification by using a self-evaluation sheet, enforcing the pill count and self-card delivery or reminder alarms so that the results obtained assessment of more compliance Objective.

5. Summary

Research can be concluded that there was increased adherence to Papuan and non-Papuan respondents before and after the intervention that HCN intervention was more influential in non-Papuan respondents with an average increase in the value of Δ = 1.50 (Pvalue = 0.004) compared to Papuan respondents Δ = 0.90 (Pvalue = 0.024), SMS was more influential against non-Papuan respondents with an average increase of Δ value = 1.10 (Pvalue = 0.005) compared with Papuans Δ = 0.90 (Pvalue = 0.014). And HCN + SMS SMS has more effect on Papua respondents with an average increase of Δ = 1.40 (Pvalue = 0.004) compared to non-Papua Δ = 0.80 (Pvalue = 0.023). Based on the results, the district health office is expected. Mimika and Mimika Baru can apply different treatments in Papua and Non-Papuans in treating malaria treatment in infants.

6. References

1. Afiyanti Y, Rachmawati I, Milanti A. *Penulisan artikel ilmiah untuk bidang keperawatan dan kesehatan*. Jakarta: Rajawali Pers, 2015.
2. Alligood, Tomey. *Nursing theorist and their work seven*. United States of America: Elsevier, 2010.
3. Aziz, K, Palu B, Ahri, R. Pengaruh kualitas layanan home care terhadap kepuasan dan kepercayaan pasien di Kecamatan Panakkukang Kota Makasar. Jurnal Keperawatan, 2018.
4. Almatsier Y. *Prinsip dasar Ilmu gizi*. Jakarta: PT Gramedia Pustaka Utama, 2005.
5. Ahmad Y. Pemanfaatan teknologi dalam bidang kesehatan masyarakat. Jurnal Keperawatan, 2018.
6. Amoran OE. Impact of health education intervention on malaria prevention practices among nursing mothers in rural communities in Nigeria. Nigerian Medical Journal. ; 54(2), 115–122. https://remote-lib.ui.ac.id:2116/10.4103/0300-1652.110046
7. Ariani N, Maulana A. Hubungan pemberian informasi obat dengan kepatuhan minum obat antibiotik pada pasien rawat jalan di puskesmas remaja Samarinda. Jurnal Keperawatan, 2016.
8. Andriani M, Wirjatmaji B. *Pengantar gizi masyarakat*. Jakarta: Kencana Prenada Media Grup, 2012.
9. Ashley EA, Mehul D, Fairhurst RM, Chanaki A, Parath L, Seila S. *et al*. Spread of artemisinin resistance in 0RW1S34RfeSDcfkexd09rT2plasmodium falciparum1RW1S34RfeSDcfkexd09rT2 malaria. The New England Journal of Medicine. 2014; 371(5):411-423. doi: http://remote-lib.ui.ac.id:2087/10.1056/NEJMoa1314981
10. Astuti, F, Sulistyowati, T. Hubungan tingkat pendidikan ibu dan tingkat pendapatan keluarga dengan status gizi anak prasekolah dan sekolah dasar di Kecamatan Godean. Jurnal Keperawatan, 2013.
11. Badan pengelola statistik. Statistik Indonesia 2018. https://www.bps.go.id/dynamictable/2018/06/06/1464/angka-kematian- neonatal-akn-dan-angka-kematian-bayi-per-1000-kelahiran-menurut- provinsi-2012.html
12. Beer N, Ali AS, Rotllant G, Abass AK, Omari RS, Al-mafazy AH, Källander K. Adherence to artesunate–amodiaquine combination therapy for uncomplicated malaria in children in zanzibar, tanzania. Tropical Medicine & International Health. 2009; 14(7):766-774. doi:10.1111/j.1365-3156.2009.02289.x
13. Blasco B, Leroy D, Fidock DA. Antimalarial drug resistance: Linking plasmodium falciparum parasite biology to the clinic. Nature Medicine. 2017; 23(8):917-928. doi: http://remote-lib.ui.ac.id:2087/10.1038/nm.4381
14. BPS. Sensus penduduk Kabupaten Mimika. Available from, 2010. https://mimikakab.bps.go.id/
15. BPSa. Jumlah penduduk Kabupaten Mimika perkelompok umur. Available from, 2018. https://mimikakab.bps.go.id/statictable/2019/09/25/67/jumlah-penduduk-menurut-kelompok-umur-dan-jenis-kelamin-di-kabupaten-mimika-2018.html
16. BPSb. Jumlah penduduk Kabupaten Mimika per kecamatan. Available from, 2018. https://mimikakab.bps.go.id/statictable/2019/09/25/66/distribusi-dan-kepadatan-

penduduk-menurut-distrik-di-kabupaten-mimika-2018.html
17. Cerqueira GC, Cheeseman IH, Schaffner SF, Nair S, McDew-White M, Aung PP, Neafsey DE. Longitudinal genomic surveillance of 0RW1S34RfeSDcfkexd09rT2plasmodium falciparum1RW1S34RfeSDcfkexd09rT2 malaria parasites reveals complex genomic architecture of emerging artemisinin resistance. Genome Biology, 2017, 18. doi: http://remote-lib.ui.ac.id:2087/10.1186/s13059-017-1204-4
18. Cherry James D. *et al.* Textbook of ediatric infection disease, ed. 8. Elsevier. USA; Philadelphia Company community partnerships for health Indonesia. (2013). Program terpadu pengendalian malaria di Papua, 2019.
19. Conn VS, Ruppar TM, Enriques M, Cooper P. Medication adherence interventions that target subjects with adherence problems: systematic review and meta-analysis. Journal PMC National library of Medicine, 2015.
20. Darma K. *Metodologi penelitian keperawatan: Panduan melaksanakan & menerapkan hasil penelitian.* Jakarta: CV Trans Info Media, 2015.
21. Departemen Kesehatan Republik Indonesia. Profil kesehatan Kabupaten Mimika, 2017.
22. Departemen Kesehatan Republik Indonesia. Profil kesehatan kabupaten Mimika, 2016.
23. Dierickx S, Gryseels C, Mwesigwa J, O'Neill S, Bannister-Tyrell M. Ronse M. *et al.* Factors associated with non-participation and non-adherence in directly observed mass drug administration for malaria in the gambia. Plos One. 2016; 11(2), e0148627. doi:10.1371/journal.pone.0148627
24. Djamaludin N, Eveline P. *Panduan pintar merawat bayi dan balita*. Jakarta: PT Wahyu Media, 2010.
25. Dondorp AM, Nosten F, Yi P, Das D, Phyo AP, Tarning J, *et al*. Artemisinin resistance in plasmodium falciparum malaria. The New England Journal of Medicine. 2009; 361(5):455-67. doi:http://remote-lib.ui.ac.id:2087/10.1056/NEJMoa0808859
26. Fauzi R, Nishaa K. *Apoteker hebat, terapi taat, pasien sehat: Panduan simpel mengelola kepatuhan terapi*. Yogyakarta: Stiletto Indie Book, 2018.
27. Fatmawati Andani S, Kurniawati H. Faktor-faktor yang berpengaruh terhadap kepatuhan minum obat pasien diabetes meelitus tipe 2 di RSUD Dr. Moewardi periode Oktober 2016-Maret 2017. Jurnal Universitas Muhammadiyah Surakarta, 2017.
28. Fedora, DA, Septiawan N, Putra F. Pengaruh gaya pengasuhan orang tua terhadap karakter disiplin, tanggung jawab, dan penghargaan pada anak usia middle childhood. Jurnal keperawatan, 2012.
29. Finn KG. *Pediatric survivors of severe malaria: Academic performance following a cognitive intervention in uganda* (Order No. 10903069). Available from ProQuest Dissertations & Theses Global. (2080342234). Retrieved from, 2018. https://remote-lib.ui.ac.id:2089/docview/2080342234?accountid=17242
30. Ghozali I. *Aplikasi analisis multivariate dengan program SPSS*. Semarang: Badan penerbit Universitas Diponegoro, 2009.
31. Harijanto N, Gunawan C, Nugroho A, Poesporodjo R. *Malaria: tata laksana klinis dan terapi, edisi 3.* Jakarta: EGC, 2018.
32. Hasyim H, Dale P, Groneberg DA, Kuch U, Müller R. Social determinants of malaria in an endemic area of Indonesia. Malaria Journal. 2019; 18(1). doi:10.1186/s12936-019-2760-8
33. Haryatiningsih A, Alam A, Sitorus T. Hubungan lamanya terapi ARV dengan kepatuhan minum obat pada anak HIV di klinik Teratai. Jurnal Universitas Padjajaran, 2017.
34. Hillebrand F, Trosby F, Holley K, Harris I. Short message service: the creation of personal global text messaging. Inggris: Wiley, 2010.
35. Irnawati M, Siagian T, ttay R. Pengaruh dukungan keluarga terhadap kepatuhan minum obat pada penderita tuberculosis di Puskesmas Motoboi kecil Kota Kotamobagu. Jurnal UNSRAT, 2016.
36. Kementrian kesehatan Republik Indonesia. Laporan akuntabilitas kinerja Kementrian Kesehatan, 2013.
37. Kementrian kesehatan Republik Indonesia. Profil kesehatan Indonesia, 2014.
38. Karmila, Lestari D, Herawati. Dukungan keluarga dengan kepatuhan minum obat pada pasien gangguan jiwa di wilayah kerja Puskesmas Banjarbaru. *Jurnal keperawatan*.
39. Kasim N, Palu B, Ahri R. Evaluasi program layanan home care di Wilayah Kerja Puskesmas Batua. Jurnal Fakultas Kesehatan Masyarakat Universitas Indonesia, 2018.
40. Lin JT, Juliano JJ, Wongsrichanalai C. *Drug-Resistant Malaria:* The Era of ACT. Current Infectious Disease Reports. 2010; 12(3):165–173. doi:10.1007/s11908-010-0099-y
41. Lopulalan O, Suhartono, Kuntjoro T. Analisis faktor-faktor yang berhubungan dengan kejadian drop out penderita TB paru di puskesmas Kota Sorong. Jurnal Universitas Airlangga, 2016.
42. Lubis K, Harjoko A, Dewi F. Desain sistem pengingat berbasis SMS untuk meningkatkan kepatuhan pengobatan pasien diabetes mellitus. Jurnal Universitas Muhammadiyah Surakarta, 2015.
43. Marni. *Asuhan keperawatan anak pada penyakit tropis*. Jakarta: PT Gelora Aksara Pratama.
44. Maulana S. *5 proyek popular SMS gateway: cara praktis dan mudah membangun SMS gateway*. Jakarta: PT Elex Media Komputindo.
45. Murdiyanti P. *Pengantar riset keperawatan*. Yogyakarta: Pustaka Baru, 2016.
46. Munif A, Lamria, Lafrizar. Faktor-faktor yang mempengaruhi kejadian malaria di Indonesia. Jurnal keperawatan, 2010.
47. Meilianingsih L, Setiawan R. Pelayanan home care terhadap tingkat kemandirian keluarga dalam merawat anggota keluarga dengan diabetes mellitus tipe 2. Jurnal keperawatan persatuan perawat nasional Indonesia, 2017.
48. Munawaroh S. Pola asuh mempengaruhi status gizi balita relationship of parenting pattern and toddlers nutrititional status. Jurnal keperawatan. 2015; 6:1.
49. Mapanawang A. Farmakokinetik dan farmakodinamik dehidroartemicin pada pasien malaria falciparum tanpa komplikasi di Halmahera. Jurnal Keperawatan Universitas Gajah Mada, 2015.
50. Muhamad M. Etika dan Filsafat Komunikasi. Jakarta:

Prenadamedia Grup, 2012.
51. Nofrion. *Komunikasi pendidikan: penerapan teori dan konsep komunikasi dalam pembelajaran.* Jakarta: Kencana, 2016.
52. Ndefo UA, Davis PN, Henry A. Effect of home-based asthma medication therapy managements program on pediatric African americans with uncontrolled asthma. Journal of the American pharmacists association. 2019; 59:521-526.
53. Najmah. *Epidemiologi penyakit menular*. Jakarta: CV trans info media, 2016.
54. Nugroho EA. *Prinsip aksi dan nasib obat dalam tubuh*. Yogyakarta: Pustaka Pelajar, 2010.
55. Nugraheni H, Wiyatini T, Wiradona I. *Kesehatan masyarakat dalam determinan social budaya*. Yogyakarta: CV Budi Utama, 2018.
56. Nurjanah N, Septiani DT. Hubungan jarak kelahiran dan jumlah balita dengan status gizi di RW 07 wilayah kerja puskesmas Cijerah Kota Bandung. Jurnal keperawatan anak persatuan perawat nasional Indonesia, 2013, 1(2).
57. Oktiawati A, Khodijah, Setyaningrum I, Dewi R. *Teori dan konsep keperawatan pediatric*. Jakarta: CV Trans Info Media, 2017.
58. Onyango EO, Ayodo G, Watsierah CA, Were T, Okumu W, Anyona SB, Ouma C. Factors associated with non-adherence to artemisinin-based combination therapy (ACT) to malaria in a rural population from holoendemic region of western kenya. BMC Infectious Diseases. 2012; 12(1):143-143. doi: 10.1186/1471-2334-12-143
59. Ortiz, MEP, Goulet P, Kogelman L, Levkoff SE, dan Weitzman PF. Feasibility of a texting intervention to improve medication adherence among older HIV + African Americans: A mixed-method pilot study. Journal gerontology and geriatric medicine, 2019.
60. Parellangi A. *Home care nursing: Aplikasi praktik berbasis evidence- based*. Yogyakarta: CV Andi Offset, 2015.
61. Price, Gwin. *Pediatric nursing-an introductory text*. United States of America: Elsevier, 2014.
62. Polit DF, Beck CT. *Nursing research generating and assessing evidence for nursing practice 8 ed.* Philadelphia: Lippincott William and Wilkins, 2008.
63. Pusmarani J, Mustofa, Darmawan E. Pengaruh pemberian edukasi obat terhadap kepatuhan minum obat warfarin pada pasien sindrom coroner akut dan fibrilasi atrium di Rumah Sakit PKU Muhammadiyah Yogyakarta. Jurnal keperawatan, 2015.
64. Putri DM. *Pengantar riset keperawatan: konsep dan aplikasi riset dalam keperawatan*. Yogyakarta: PT Pustaka Baru Press, 2017.
65. Pameswari P, Halim A, Yustika L. Tingkat kepatuhan penggunaan obat pada pasien tuberculosis di Rumah Sakit Mayjen H.A. Thalib Kabupaten Kerinci. Jurnal Sains Farmasi Klinis, 2016.
66. Pemerintah Provinsi Papua. Data geografis, 2013. https://pemkam.papua.go.id/data_geografis.php
67. Qomariah A. Tema budaya melatarbelakangi perilaku ibu-ibu penduduk asli dalam pemeliharaan kehamilan dan persalinan di Kabupaten Mimika. Jurnal keperawatan, 2007.
68. Rokhman M, Darakay C, Raditya R. Pengaruh pemberian home care oleh apoteker pada pasien diabetes melitus. Jurnal Keperawatan Universitas Gajah Mada, 2015.
69. Rahma P, Galistiani G, Kusuma A. Pengaruh short message service terhadap kepatuhan pengobatan dan gaya hidup pasien diabetes mellitus di RSUD DR. M. Ashari Pemalang. Jurnal Keperawatan UAD, 2016.
70. Riadi E. *Metode statistika parametric nonparametric untuk penelitian ilmu-ilmu sosial dan pendidikan*. Jakarta: PT Pustaka Mandiri.
71. Sugiyono. *Metode penelitian kuantitatif, kualitatif, dan R&D*. Bandung: Alfabeta, 2016.
72. Staf pengajar ilmu kesehatan anak Fakultas kedokteran UI. Ilmu kesehatan anak Jakarta: Info Medika, 1985, 2.
73. Sumampouw OJ, Soemarna Andarini S, Sriwahyuni E. *Diare balita: suatu tinjauan dari bidang kesehatan masyarakat.* Yogyakarta: CV. Budi utama, 2017.
74. Sulistoningsih, Hariyani. *Gizi untuk kesehatan ibu dan anak*. Yogyakarta: Graha Ilmu.
75. Soetjiningsih. *Tumbuh kembang anak. Edisi 2*. Jakarta: EGC. Survey demografi kesehatan Indonesia, 2015. (2017). Survei demografi, https://www.era.id/read/0KU8bO-tingginya-angka-kematian-bayi-di- indonesia SDKI 2017.
76. Saputra A, Agustin F. *Membangun sistem aplikasi e-commerce dan SMS.* Jakarta: PT. Alex Media Komputindo.
77. Setiadi. (2017). *Dasar-dasar farmakologi untuk keperawatan*. Yogyakarta: Indomedika Pustaka, 2012.
78. Setyawati V, Hartini E. *Buku ajar dasar ilmu gizi kesehatan masyarakat*. Yogyakarta: CV. Budi Utama, 2018.
79. Sinha S, Medhi B, Sehgal R. Challenges of drug-resistant malaria. Parasite, 2014; 21,61. doi:10.1051/parasite/2014059
80. Siswanto I, Yanwirasti, Usman E. Hubungan pengetahuan dan dukungan keluarga dengan kepatuhan minum obat anti tuberculosis di Puskesmas Andalas Kota Padang. Jurnal Fakultas Kedokteran Universitas Andalas, 2015.
81. Susanti C. Pengaruh pemanfaatan short message service (SMS) pengingat jadwal terhadap keaktifan kader posyandu lanjut usia kriwen Kabupaten Sukoharjo. Jurnal Keperawatan Universitas Padjajaran, 2016.
82. Steury Elinda Enright, PhD RN. Mobile phone short message service to improve malaria pharmacoadherence in zambia. Journal of Nursing Scholarship. 2016; 48(4):354-361. doi:http://remote-lib.ui.ac.id:2087/10.1111/jnu.12216
83. Talisuna OA. *et al*. 'Efficacy of text-message reminders on pediatric malaria treatment adherence and their post-treatment return to health facilities in Kenya: a randomized controlled trial'. Malaria Journal, 2017.
84. Tjay HT, Rahardja K. *Obat-obat penting edisi 6*. Jakarta: PT. Alex Media Komputindo, 2013.
85. Utaminingrum W, Pranitasari R, Kusuma A. *Pengaruh home care apoteker terhadap kepatuhan pasien hipertensi*. Jurnal Keperawatan USD, 2017.
86. White NJ, Pukrittayakamee S, Hien TT, Faiz MA, Mokuolu, OA, Dondorp AM. Malaria. The Lancet. 2014; 383:9918, 723-35. doi:http://remote-lib.ui.ac.id:2087/10.1016/S0140-6736(13)60024-0
87. Widoyono. *Penyakit tropis epidemiologi, penularan, pencegahan dan pemberantasan. Edisi 2*. Semarang: PT. Gelora Aksara pertama, 2011.

88. Wijanarko J. *Intim orangtua-anak*. Jakarta: Keluarga Indonesia Bahagia, 2016.
89. Wirawan A, holat N. 'The effect of Education through Short Message Service (SMS) Message on Diabetic. Jurnal Keperawatan Universitas Padjajaran, 2017.
90. Wulandari DH. Analisis faktor-faktor yang berhubungan dengan kepatuhan pasien tuberculosis paru tahap lanjutan untuk minum obat di RS Rumah Sehat Terpadu tahun 2015. Jurnal Rumah Sakit Indonesia, 2018.
91. Xu DR. *et al*. Lay health supporters aided by mobile text messaging to improve adherence, symptoms, and functioning among people with schizophrenia in a resource-poor community in rural china (LEAN): A randomized controlled trial. Journal keperawatan pubmed, 2019.