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The Effectiveness of Transcultural Nursing Model to Improve Malaria Childcare

Lamria Situmeang, Sulistiyani, Elizabeth Mebri, Lalu Guntur Payasan*
Poltekkes Kemenkes Jayapura, Indonesia
**email: lalumguntur@gmail.com*

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ABSTRACT
Malaria is endemic to Papua due to various factors, rendering its eradication a continual challenge. Nurses, as healthcare practitioners engaged in malaria management, frequently encounter clinical and sociocultural challenges. Consequently, transcultural nursing has emerged as an effective approach to improve pediatric malaria treatment. This study seeks to assess the efficacy of the transcultural nursing model in enhancing malaria care for children provided by their families. This quasi-experimental design used two groups: a control group and an intervention group, each comprising 50 participants. Data analysis utilized t-tests and a general linear model to evaluate the efficacy of the transcultural nursing model among groups subjected to three interventions over time The findings indicated notable disparities in child malaria care practices between the control and intervention groups, as demonstrated by both the t-test and general linear model analyses. This research concludes the transcultural nursing model can effectively address cultural barriers in the provision of nursing care for malaria.
***Keywords**: Behavior; Care; Children with Malaria; Transcultural Nursing*

ABSTRAK
Papua menjadi endemik malaria disebabkan oleh multifaktor sehingga dalam eliminasinya masih menjadi tantangan. Perawat sebagai salah satu tenaga kesehatan yang terlibat langsung dalam proses penanganan malaria tidak jarang mengalami kendala baik yang bersifat klinis maupun sosial budaya. Transkultural nursing diciptakan untuk menjembatani kendala yang dialami perawat dalam memberikan asuhan kepada pasien malaria baik pada individu, keluarga dan komunitas. Tujuan penelitian ini ialah mengkaji pengaruh model transkultural nursing untuk meningkatkan asuhan anak malaria oleh keluarga. Penelitian ini menggunakan pendekatan eksperimen semu dengan dua kelompok yakni kontrol dan intervensi dengan

masing-masing 50 orang. Analisa data yang digunakan ialah *t-test* dan *general linier model* guna melihat perbandingan efektivitas penerapan model transkultural nursing ini baik pada setiap kelompok dengan tiga kali perlakuan (antar waktu). Hasil penelitian ini memperlihatkan bahwa pada ada perbedaan yang signifikan perilaku perawatan anak dengan malaria antara kelompok kontrol dan intervensi baik pada uji *t-test* maupun *general linier model*. Kesimpulan model transkultural nursing dapat diterapkan dalam membantu menjembantani kendala budaya dalam penerapan asuhan keperawatan pada konteks malaria.
Kata Kunci: Anak dengan Malaria; Perawatan; Transkultural *Nursing*

INTRODUCTION

Malaria is a mosquito-transmitted illness, with Papua province documenting the highest prevalence in Indonesia, representing 79% of the annual parasite incidence (API) cases in 2023. Jayapura Regency exhibits the highest incidence at the district level in the nation. If not treated promptly, malaria can lead to gradual mortality. It is transmitted by the bite of female Anopheles mosquitoes, which inject parasites into the human body. Malaria is documented in 95 nations, with approximately 3.2 billion individuals, or nearly half of the global population, susceptible to infection. Children under five constitute a highly vulnerable demographic, with around 438,000 malaria-related fatalities documented globally in 2015, of which 69% were children in this age group (WHO, 2016).

In 2018, Indonesia documented 222,085 cases of malaria nationwide. The five provinces with the highest incidence were Papua, West Papua, Maluku, North Maluku, and East Nusa Tenggara. Jayapura Regency recorded the highest Air Pollution Index (API), surpassing 100, followed by other regencies in Papua, such as Keerom, Sarmi, and Timika.

Indonesia aims to eliminate malaria by 2030 (Kemenkes, 2018), requiring strategic actions to diminish the incidence of mosquito bites from Anopheles sp. Indonesia's malaria presents four variants: Plasmodium falciparum, Plasmodium vivax, Plasmodium malariae, and Plasmodium ovale.

In 2015, Indonesia reported 209,413 cases of malaria (Kemenkes RI, 2016). In Jayapura Regency, 2,600 malaria cases were documented in children aged 1 to 4 years from January to December 2015 (Dinkes Kabupaten Jayapura, 2015). Data from the Sentani Health Center between January and April 2016 indicated 265 cases within the same age demographic. Heni Sesanti (2019) identified 290 cases of malaria, predominantly affecting individuals aged 14–64 (52.1%), with a male representation of 53%, and the peak

incidence recorded in March (40%). Sesanti's research identified 98 incidence hotspots, with RW 3 documenting the highest number of cases (37). RW 3 is situated adjacent to a forest, characterized by marshy land that facilitates mosquito proliferation owing to stagnant water.

Local health workers report that certain community members improperly utilize bed nets. Some individuals suspend them without utilizing them, fold and stow them in cabinets, or even repurpose them for angling. The effective utilization of bed nets is essential for malaria prevention; however, hesitance to employ them arises from a misapprehension of their advantages, especially regarding the initial scent of insecticide-treated nets.

This misconception, along with Papua's community opposition to external interventions, presents obstacles for malaria prevention and health promotion initiatives. Sullivan & Bettger (2018) cited by Honduras and Steury (2013) in Zambia identified comparable challenges, noting that engaging local communities was essential to surmounting resistance.

Consequently, community engagement is pivotal in implementing transcultural nursing methodologies. This study aims to evaluate the efficacy of engaging local traditional leaders and applying culturally-informed nursing care as preventive and mitigation strategies for malaria cases in children at Harapan Health Center, Jayapura Regency.

METHOD

This quasi-experimental research used pre-posttest only design with control group. This research identified the effectiveness of the given intervention by involving two subject groups: the control and research groups (Siedlecki, 2020).

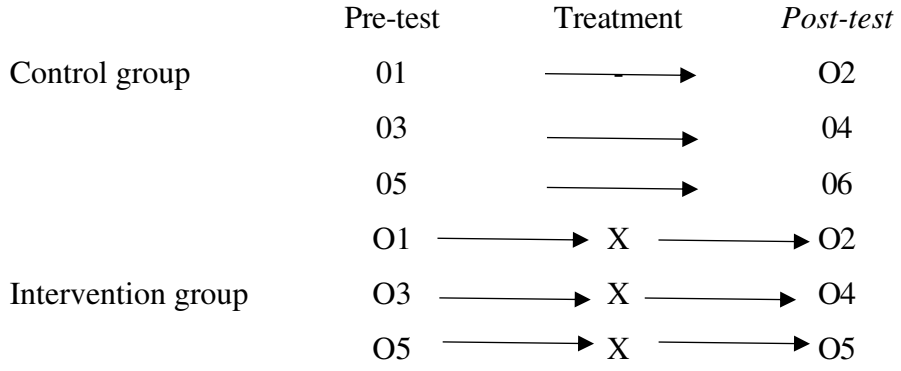


Figure 3.1 Research Design

The research lasted from May to October 2023, encompassing 50 families in both the control and intervention cohorts. Malaria cases in children were identified using

medical records from Harapan Health Center, with inclusion criteria comprising families with children under 5 years old, proficiency in Indonesian, basic literacy, and willingness to participate as respondents. Sampling was executed purposefully.

The evaluation of culturally-based nursing aspects utilized an instrument encompassing multiple dimensions: healthcare technology utilization, community beliefs and philosophies, cultural values, dependency factors, social and economic influences, and community feedback on transcultural nursing practices. The instrument comprised 50 Likert-scale items. The instrument underwent validity and reliability testing, resulting in a validity score of 0.279 via the product-moment method and a reliability score of 0.935 according to Cronbach's alpha for the culturally-based nursing model, and 0.751 for malaria child care behavior.

The data analysis encompassed frequency and percentage analysis, t-tests, post hoc tests, and a general linear model tailored to compare malaria-related childcare behaviors between the control and intervention groups. Child care behavior included families' readiness to embrace nursing and healthcare practices or technologies that originated beyond their cultural traditions.

The study was subjected to ethical feasibility assessment by the Ethics Committee of the Health Polytechnic of the Ministry of Health in Jayapura, which deemed it ethically viable, as confirmed by Ethical Approval Letter No: 271/KEPK-J/VIII/2023.

RESULTS

This study was performed within the jurisdiction of Harapan Health Center, one of the 20 health centers in Jayapura Regency, located in Nolokla, East Sentani District, Jayapura Regency. The health center is accredited and operates as an outpatient facility. Harapan Health Center ranks fourth in visit frequency, following Sentani, Waibu, and Yapsi Health Centers. Moreover, Harapan Health Center oversees the highest quantity of Posyandu (integrated health service posts), amounting to 39 (Dinkes Kabupaten Jayapura, 2023).

Harapan Health Center employed 15 nurses, 13 midwives, 1 public health officer, 3 sanitarians, 4 nutritionists, 3 medical laboratory technicians, 1 pharmaceutical technician, 1 pharmacist, 2 general practitioners, and 2 dentists.

In 2022, Harapan Health Center ranked among the top three health centers for malaria prevalence, documenting 4,981 cases and two fatalities attributed to malaria (Dinkes Kabupaten Jayapura, 2023).

1. Respondents' Characteristics

The univariate analysis was useful to determine the distributions in terms of frequency and percentage of each variable. Here is univariate analysis of the respondents' characteristics of the cultural-based care model.

Table 1. The respondents' characteristics of both groups

Variables		Groups		Total
		Control	Treatment	
Sex	Male	28 (56%)	31 (62%)	59
	Female	22 (44%)	19 (38%)	41
Age	18-45	40 (80%)	37 (74%)	77
	46-59	10 (20%)	13 (26%)	23
Education level	Primary	11 (22%)	9 (18%)	20
	Junior	26 (62%)	26 (52%)	52
	High	13 (26%)	15 (39%)	30
Earning	<RMW	32 (64%)	29 (58%)	61
	>RMW	18 (36%)	21 (42%)	39
Pediatric care history at the hospital due to Malaria	Never	31 (62%)	38 (76%)	69
	Recorded	19 (38%)	12 (24%)	31

Source: primary data 2023

The table shows most respondents are males for both groups; the dominant age is within the range between 18 and 45 years old. Most respondents have senior education level; earning lower than RMW; and experience of receiving treatment at hospital due to malaria.

2. The Normality Test

The researchers used Kolmogorov-Smirnov normality test assisted by SPSS because the sample was more than 50. The normality test result normal data distribution if the p-value > 0.05. Here are the results:

Table 2. Normality Test Results

Variables	Groups	*p-value**	
		Pre-Test	***Post-test***
Caring behavior for children with malaria	Control	0.200	0.200
	Intervention	0.200	0.101

* *Kolmogorov-smirnov*

The table shows normality data for both groups have normal data distribution, p-value higher than 0.05.

The researchers used Levene to examine the variance homogeneity. The assumption of the homogeneity is – p-value higher than the α = 0,05. Here is the result:

3. Homogeneity Test

Table 3. Homogeneity Test

Variable	Coefficient	*p-value**	Remarks
Caring behavior for children with malaria	19.719	0.096	Homogenous

**Levene Test*

The table shows the variable variance is homogenous because the p-value is higher than 0.05.

4. The influence of transcultural nursing model to improve caring behavior for children with malaria

The bivariate analysis used t-test for both groups, including the group with transcultural care. Here are the results.

Table 4. the Dependent T-Test for Control and Intervention Groups

Variable	Groups	***Pre-Test***	***Post-test***	***p-value****
		Mean ± SD	**Mean ± SD**	
Caring behavior for children with malaria	Control	2.862±0.700	2.852±0.704	0.570
	Intervention	4.767±0.848	6.319±0.541	0.000

**Paired t-test*

Table 5.4 shows the analysis of the culturally-based nursing care model in the intervention group yielded a p-value of 0.000 (p-value<0.05), indicating a difference before and after the treatment in the intervention group. The mean pre-test score is 4.767, and the mean post-test score is 6.319. Meanwhile, the analysis results on the variable of malaria child care behavior in the control group has a p-value of 0.570, indicating no significant difference in malaria child care behavior. The mean

pre-test score is 2.862, while the mean post-test score is 2.852.

Table 5. the Independent T-Test of Control and Intervention Groups

	Groups		***p-value****
	Control	**Intervention**	
Post-test	2.852	6.319	0.000

**Independent t-test*

The table above reveals that the test for the difference in average child care behavior with malaria between the control and intervention groups yielded a significance value of 0.000. The significance value (0.000) is less than the alpha of 0.05, indicating a significant difference in the child care behavior with malaria, as evidenced by the higher average of the intervention group (6.319) compared to the control group (2.852).

5. The Analysis of General Linear Model of Behavioral Changes from Time to Time

General linear model was useful to examine the mean difference of the cultural-based nursing care model effects on three time-interval measurements. Here are the detailed tables.

Table 6 General Linear Model-Uji Repeated Anova

Groups	Source		Type III Sum of Squares	df	Mean Square	F	Sig*.
Control	Time	Sphericity Assumed	15,160	2	7,580	27.006	.000
		Greenhouse-Geisser		1,725	8,791		.000
		Huynh-Feldt		1,782	8,509		.000
		Lowe-bound		1,000	15,160		.003
	Error (Time)	Sphericity Assumed	27,507	98	.281		
		Greenhouse-Geisser		84,505	.326		
		Huynh-Feldt		87,302	.315		
		Lowe-bound		49,000	.561		

Intervention	Time	Sphericity Assumed	405.971	2	101.493	264.925	.000
		Greenhouse-Geisser	405.971	2.565	158.279	264.925	.000
		Huynh-Feldt	405.971	2.751	147.584	264.925	.000
		Lowe-bound	405.971	1.000	405.971	264.925	.000
	Error (Time)	Sphericity Assumed	62.829	164	.383		
		Greenhouse-Geisser	62.829	105.161	.597		
		Huynh-Feldt	62.829	112.782	.557		
		Lowe-bound	62.829	41.000	1.532		

**Repeated measures annova*

The Tests of Within-Subjects Effects indicates that the Greenhouse-Geisser Sig value is between 0.000 and 0.05. Therefore, each repetition time reveals a significant difference in the average malaria care behavior of children with malaria. Meanwhile, for the intervention group, the Greenhouse-Geisser Sig value is 0.000 < 0.05, indicating a significant difference over time in the intervention group.

To obtain information regarding the average behavior of malaria treatment for children at each measurement over time (PostH3, PostH6, PostH9), refer to the following pairwise table.

Table 7. the Post Hoc Control Group

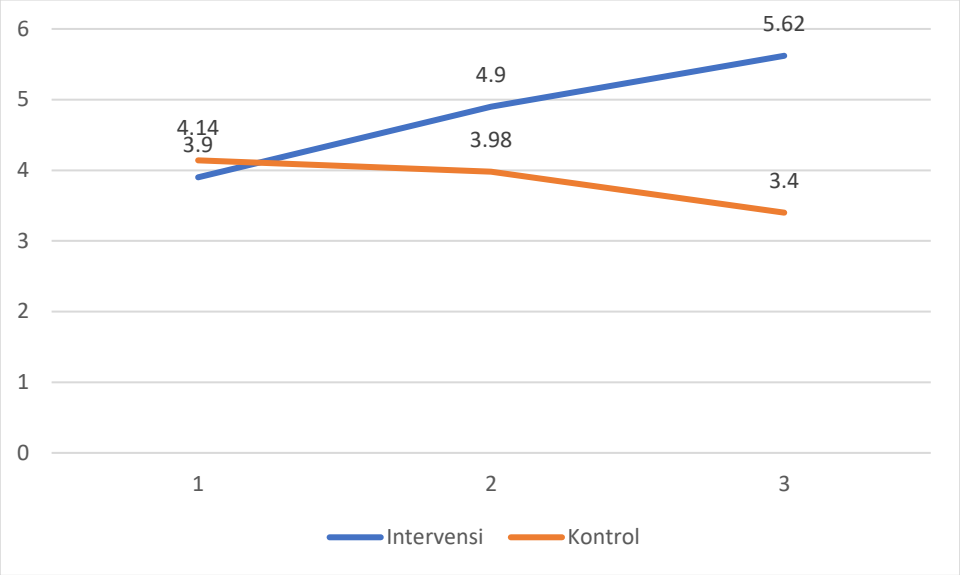
Groups		Δ Mean	*p-value*
Control	PostH3-PostH6	0.405	0.079
	PostH6-PostH9	0.167	1.000
	PostH9-Post3	0.310	1.000
Intervention	PostH3-PostH6	1.571	0.000
	PostH6-PostH9	1.119	0.000
	PostH9-Post3	3.905	3.372

*Uji *Post Hoc Pairwise Comparisons*

Table 7 shows the differences in results between the control group and the intervention group. The difference in the impact of the culturally-based nursing care model on the control group only occurred in the post-test measurement results from day 9 compared to day 3. Meanwhile, for the intervention group, there are significant changes in the post-test results from day

3 to day 9, with increases of 1.571, 1.119, and 3.905. The increase is significant with a Sig. value of 0.000 < 0.05. Therefore, the intervention group experienced a significant increase in caring for children with malaria after PostH6. Figure 1 shows the reading of the differences over time.

Figure 1 the Comparison of Caring Behaviors of Children with Malaria from both Groups



The differences between both group deal with the over-time increase from post-intervention on day 15 for control group and post-intervention on day 16 for the intervention group.

DISCUSSION

1. Respondents' Characteristics

The characteristics of respondents varied, with males dominating the control group and females in the intervention group. All respondents were aged 18–45 years; the majority had a middle school education, earned below the minimum wage in Jayapura Regency, and most had children previously hospitalized for malaria.

The variation in gender distribution across the control and intervention groups arose because the researchers did not limit the respondents to mothers only. The researchers also allowed fathers and other family members to participate. Additionally, according to data from the Department of Population and Civil Registration of Jayapura Regency, the male and female populations in East Sentani District were nearly equal, with 5,581 males and

5,411 females (Dukcapil Jayapura, 2023).

The Central Bureau of Statistics (BPS) of Jayapura Regency (2023) found most residents in the regency were employed in 2022, with 60,479 working individuals compared to 3,821 unemployed in the productive age group. However, most reported occupations involved household management, aligning with the finding that most respondents earned below the minimum wage. BPS also reported that 15,430 people in Jayapura Regency lived below the poverty line.

In terms of education, most respondents had a middle school or high school education, which aligns with the availability of educational facilities. BPS data showed 47 junior high schools (SMP) and 23 high schools (SMA) or their equivalents in Jayapura Regency. In East Sentani District specifically, there were 3 junior high schools and 4 high schools. Observations revealed that respondents came not only from the mainland but also from islands within the Harapan Health Center's jurisdiction.

2. The Influence of Transcultural Care Model to Improve Malaria Childcare

The behavior of malaria childcare in the intervention group showed a significant difference with a p-value of 0.000 (p-value < 0.05), indicating a significant change before and after the intervention. The mean pre-test score was 4.767; the mean post-test score was 6.319. Conversely, the control group showed no significant changes, with a p-value of 0.570, an mean pre-test score of 2.862, and a post-test score of 2.852.

The findings demonstrated a clear difference between the group that received the transcultural nursing model intervention and the group that did not. Previous research by Erika (2016) supported these results, demonstrating that transcultural nursing models improved mothers' knowledge and behavior in caring for children with malaria. Similarly, studies by Rosiah & Laili (2023) and Hardini, Rustina, & Syahreni (2019) indicated significant improvements in family enthusiasm, knowledge, and childcare behaviors when using a transcultural nursing approach.

Transcultural nursing models focus on values, beliefs, and cultural adoption in nursing practices from assessment to evaluation (Leininger & McFarland, 2002). Addressing cultural values and

beliefs encourages better acceptance of nursing interventions. Weidman (1988) and Giger & Haddad (2020) further emphasized that cultural approaches facilitate changes in health behavior by aligning interventions with patients' cultural norms.

3. The Differences of Malaria Childcare Behavior and Malaria Childcare Over Time

The results section outlines the differences in malaria child care behavior between the control group and the intervention group over time. Hohashi (2019) conducted research in five countries: the United States, Japan, China, Indonesia, and the Philippines, which aligns with these findings. The study focused on the implementation of culturally-based nursing care by applying family value-based care in each country. The study found that accommodating values and beliefs tends to accelerate closeness, acceptance, and the belief that the provided care is beneficial and will positively impact the family's health. Furthermore, Im & Lee (2018) explored how the acceptance and closeness between nurses and patients can significantly influence the effectiveness of nursing care.

As one example, the family's belief that malaria is a common disease , leading them to think that it has no negative impact on their family members. However, this belief would change if the family believed that malaria could cause pain to their family members. Families in the two examples above will undoubtedly behave differently when caring for children with malaria. In these examples, when a nurse implements a transcultural nursing care model that fosters closeness, the acceptance of nurses as healthcare professionals can swiftly shift the perception of malaria from a common disease to a potentially dangerous one, thereby changing the family's approach to caring for children with malaria.

4. Research Limitation

This study has some flaws, such as the incapability to track how children were cared for and how economic factors and past hospitalizations might affect those behaviors, which could make it harder to change how children are cared for during malaria.

CONCLUSION

This study found significant differences in malaria childcare behaviors between the control and intervention groups. The transcultural nursing model effectively

improved malaria childcare behaviors over time.

RECOMMENDATION

Families with children affected by malaria can apply the transcultural nursing model. Future studies should focus on long-term monitoring of childcare behavior changes over weeks and months and investigate economic and hospitalization history as factors that may hinder program success.

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