

## **Predictive Index of The Success of The Elementary School Clean and Healthy Living Behavior (PHBS) Program In The Working Area of the Sikumana Health Center, Kupang City**

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### **KEYWORDS**

clean and healthy behavior,  
predictive index, school

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### **ABSTRACT**

The PHBS program in schools is vital for preventing infectious diseases, yet its success remains inconsistent, particularly in resource-limited areas like Kupang City, East Nusa Tenggara. This study aimed to compile a predictive index for PHBS success by analyzing student, teacher, school, parental, and health center factors. An observational analytic case-control design was employed, involving 24 elementary schools (12 successful and 12 unsuccessful PHBS cases), with data collected via questionnaires and observation sheets from 242 students, 24 teachers, and health center staff. Logistic regression identified key predictors. Student actions ( $p=0.014$ ) were the strongest predictor, followed by teacher actions ( $p=0.020$ ) and school facilities ( $p=0.022$ ), while parental and health center support showed no significant impact. The predictive index formula confirmed student actions as the dominant factor ( $OR=19.362$ , 95%  $CI:1.093-343.068$ ). The findings underscore the need for targeted student-centered interventions and improved school infrastructure. Future research should validate the index in diverse settings and explore technology-based monitoring tools to enhance PHBS sustainability.

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### **Introduction**

Clean and Healthy Living Behavior (PHBS) in schools is a set of efforts implemented by school residents on the basis of awareness to prevent diseases, create a clean and healthy environment, and improve health (Abidah et al., 2018). Schools or educational institutions are chosen as strategic places in providing knowledge about the importance of living a clean and healthy lifestyle, where students are taught to do simple things (for example, washing hands with soap) that have a big impact on health. In addition, school-age children, especially elementary school (7-12 years old) are the golden age to instill PHBS values and they have the potential to become agents of change in promoting health for the surrounding environment so that they can make PHBS a positive habit that is cultured in the community.

The development of PHBS in educational institutions is carried out through three main strategies, namely 1) empowerment, 2) fostering an atmosphere, and 3) advocacy which is carried out in the form of actions (actions) as follows, namely 1) developing healthy *public policies*, 2) creating a *supportive environment*, 3) strengthening *community action movements*, 4) develop individual skills (*personal skills*), 5) reorient *health services* (Regulation of the Minister of Health of the Republic of Indonesia Number 2269/MENKES/PER/XI/2011)

In addition, based on the Regulation of the Minister of National Education of the Republic of Indonesia Number 24 of 2007 concerning Standards of Facilities and Infrastructure for Elementary Schools/Madrasah Ibtidaiyah (SD/MI), Junior High Schools/Madrasah Tsanawiyah (SMP/MTs), and Senior High Schools/Madrasah Aliyah (SMA/MA) that at least in SD/MI there are classrooms, library rooms, science laboratories, leadership rooms, teachers' rooms, places of worship, UKS rooms, latrines, warehouses, circulation rooms, and playgrounds/sports.

Clean Living and School Behavior (PHBS) in educational institutions involves various parties consisting of students, teachers, and parents. PHBS in schools is an important thing as health education. Health education teaches about physical, mental, emotional and social health which can build students' knowledge, skills, and positive attitudes about health (Mustar, et al., 2018). Health education as an effort to prevent infectious diseases, immunization, and other health services is a preventive effort that can be carried out in order to prevent disease events that can be carried out through schools because there is still a lack of students' concern for health (Almisfalah & Yuliana, 2023; Ibrahim et al., 2023; Lestari et al., 2023; Nasiatin et al., 2021; Oktiarina, 2023; Susanto et al., 2016).

Students before eating do not wash their hands first, so as to allow disease seeds to enter the body. PHBS aims to change the behavior of school residents and the school community to be healthy, so that it can prevent disease, improve health, and play an active role in creating a healthy environment. In previous studies, it was explained that there was a significant relationship between snacking outside and the incidence of diarrhea (Anisah, 2019). Snacking on healthy food is one of the aspects of clean and healthy living behavior at school.

Intervention and education in students are closely related to teachers' efforts in educating. This unhealthy behavior is also caused by an unhealthy environment, such as a lack of cleanliness of the home, school, or community environment (Hamiyah & Jauhar, 2015). The low effort to foster awareness of clean and healthy living among students has an impact on elementary school students who do not fully know how to maintain their personal or environmental health. This is in line with previous research which states that there are still students who suffer from skin diseases, leave their hair and nails elongated unkept, suffer from cavities, are not clean and neat in dressing, are less serious in carrying out gymnastics every Friday morning, often throw garbage carelessly, snack carelessly and do not pay attention to the cleanliness of snacks (Teguh, 2012). The results of the study are also in line with research that shows that the implementation of a clean and healthy living behavior program that is still low can result in a low quality of the school environment and a high rate of diseases that attack school-age children (Diana, 2013).

In educational institutions such as primary target schools, they must practice behaviors that can create PHBS Educational Institutions, which include, among others, washing hands using soap, consuming healthy food and drinks, using healthy latrines, throwing garbage in the trash, not smoking, not consuming Drugs, Alcohol, Psychotropics and other Addictive Substances (NARCO), not spitting carelessly, eradicating mosquito larvae and others (Ministry of Health of the Republic of Indonesia, 2011).

The school age period is a time when children will learn physical skills, and build a healthy physique. Starting from Kindergarten (TK), Elementary School (SD), Junior High School (SMP), and Senior High School (SMA) or Vocational High School (SMK). The development of children in elementary school age is part of the next development, so that every abnormality, the slightest will reduce the quality of human resources in the future. PHBS in schools is an activity to empower students, teachers and the school community to want to carry out a healthy lifestyle to create a healthy school.

Based on the Health Profile of the Republic of Indonesia in 2017, it is known that East Nusa Tenggara Province is among the three provinces with the lowest percentage (21.38%), the lowest four-letter literacy rate of 91.68%, the third lowest human development index is 63.73%, the poorest population in Indonesia, the two lowest number of health centers that carry out sports health activities for elementary school children, and the province with the third lowest percentage of districts/cities with a PHBS policy of 18.18% of the national target 60%. Clean and healthy living behavior policies include increasing advocacy for health-oriented development policies, developing regulations in the context of health promotion; Strengthening community movements in, health promotion and community empowerment through partnerships between government and private institutions, and civil society, as well as increasing community empowerment through public health education, Communication, Information and Education (KIE) and Community-Based Health Efforts (UKBM) including the development of healthy houses. The PHBS policy is an important component of a region as an indicator of regional success in reducing the incidence of diseases caused by unhealthy behavior. Based on the 2017 Kupang City Health Profile, Health Promotion activities are carried out including elementary school competitions with PHBS and PHBS monitoring in schools.

Lack of Clean and Healthy Living Behavior (PHBS) in school children causes the emergence of various diseases, one of which is diarrhea (Saputro et al., 2013). Based on the 2017 Sikumana Health Center Performance Assessment Report, information was obtained that the achievement of efforts to control diarrhea is still 61% lacking. Therefore, it is necessary to conduct research on indicators of PHBS success in elementary schools.

Clean and Healthy Living Behavior is all health behaviors that are carried out on awareness, so that the family and everything in it can help themselves in the health sector and play an active role in health activities in schools and communities (Ministry of Health Directorate of Health Promotion and Community Empowerment, 2019). The problem of this research is the lack of implementation or implementation of Clean and Healthy Living Behavior in State Elementary Schools in the Working Area of the Sikumana Health Center, Kupang City. The benefits of PHBS in schools are able to create a clean and healthy environment, improve the teaching and learning process and the students, teachers and the community in the school environment become healthy.

Factors that affect individual health and public health are heredity, environment, behavior and community services (Notoatmdjo. 2010). In addition to factors that affect health, there are factors that affect clean living behavior, including social class and economic class, knowledge, attitudes, health status and personal habits (Cahyaningrum, 2016). The implementation of Clean and Healthy Living Behavior (PHBS) requires the role and support of schools. The lack of role of schools in the implementation of PHBS can cause more serious problems such as the threat of infectious diseases. Schools are the source of transmission of infectious diseases in schools, including: hand and mouth infections, eye infections, dengue fever, chickenpox, measles, rubella, and mumps. If elementary school students do not understand clean and healthy living behaviors, it is not impossible to increase the high rate of these diseases. Therefore, the knowledge in school

needs to be improved by providing opportunities to practice once a week or by deepening material on clean and healthy living behaviors.

The involvement of various factors ranging from the school, parents, health centers, and student factors in the success of the Clean and Healthy Living Behavior (PHBS) program in schools. Therefore, it is necessary to conduct research on the predictive index of PHBS success in elementary schools.

The purpose of this study is to compile a predictive index for the success of the Clean and Healthy Living Behavior (PHBS) program in elementary schools within the Sikumana Health Center's area in Kupang City, East Nusa Tenggara, by analyzing the influence of student factors, teacher factors, school support, parental support, and health center (puskesmas) support on the program's success, and ultimately formulating a predictive index formula to assess its effectiveness. This study advances previous research by developing a predictive index formula for the success of the Clean and Healthy Living Behavior (PHBS) program in elementary schools, specifically in the underserved region of East Nusa Tenggara, Indonesia. Unlike prior studies that focused on individual factors (e.g., knowledge, attitudes) or qualitative assessments (Afnilda, 2010; Diana et al., 2013), this research quantitatively identifies student actions as the most dominant predictor of PHBS success, formalized in the equation:  $\text{PHBS Success} = -10.301 + 2.963 \times \text{student actions}$ . It also highlights the limited impact of parental and health center support, contrasting with earlier assumptions (Lina, 2016), and emphasizes the critical role of school facilities, aligning with but expanding on Suryani's (2017) findings. The study's case-control design and multivariable regression analysis provide a robust methodological novelty, offering a replicable model for similar settings.

## Research Method

This study is an observational analytical study using a case-control design to analyze the causal relationship between factors influencing the success of the Clean and Healthy Living Behavior (PHBS) program in elementary schools. Conducted from January 2020 to February 2021 in the Sikumana Health Center's working area (Kupang City, East Nusa Tenggara), the research involved 24 elementary schools—12 case samples (unsuccessful PHBS implementation) and 12 control samples (successful PHBS implementation). Respondents included 24 teachers (one per school), 242 fifth-grade students, and two health center representatives for interviews. Data collection used observation sheets and questionnaires to assess the program's success and contributing factors.

**Table 1. Number of Schools Respondent Students Each**

Yes	Number of Elementary School Student Respondents Case	Yes	Number of Respondents of Control Elementary School Students
1	Tunas Mandiri Elementary School 11	1	SD Oepura 4 10
2	STA Family SDK 10	2	SD GMIT Oepura 12
3	MI Darul Hijra Madani 9	3	Fatuberia Elementary School 10
4	Kolhua Elementary School 10	4	Sikumana Branch Elementary School 10
5	Elementary School 1 11	5	Nefosaka Elementary School 10
6	Elementary School 3 9	6	SD Harmony 10
7	Elementary School 10	7	SD Oepura 3 10
	Generation Bangsa		

Yes	Number of Elementary School Student Respondents Case	Yes	Number of Respondents of Elementary School Students	Control
8	SDI Bello	10	8	Creative S.S.
9	Superior Generation Elementary School	10	9	SD CIPS
10	Pethuk Kholhua Elementary School	10	10	SD Oepura 1
11	SD Sikumana 2	10	11	Anugrah Elementary School
12	SD Oepura 2	10	12	SD Naikoten 2
<b>Total</b>		120	Total	122

## RESULTS AND DISCUSSION

The respondents in this study consisted of teachers in charge of the School Health Unit (UKS) and 9 to 12 representatives of 5th grade elementary school students from 24 elementary schools (SD) in Sikumana district.

The characteristics of the respondents are as follows:

**Table 2. Characteristics of Student Respondents**

Yes	Characteristics of Student Respondents	n (%)
1	Total Student Respondents	242 (100,0)
2	Student gender	
	Man	158 (65,3)
	Woman	84 (34,7)
3	Age of students	
	<11 years old	113 (46,7)
	11 years old	120 (49,6)
	>11 years old	9 (3,7)
	Mean	10,56

Based on table 2, the results were obtained that the majority of student respondents were 65.3% male with the age of majority 11 years 49.6%.

**Table 3. Characteristics of Teacher Respondents**

Yes	Characteristics of respondents	n (%)
1	Total Teacher respondents	24 (100,0)
2	Gender of teachers	
	Man	11 (45,8)
	Woman	13 (54,2)
3	Teacher's age	
	≤ 34	9 (37,5)
	35 – 47	9 (37,5)
	47 <	6 (25,0)
	Mean	38,96

Based on table 3, the results were obtained that the majority of teacher respondents were women 54.2% with the majority age ≤ 34-47, which was 75.0%.

### The Influence of Student Factors consisting of Student Knowledge, Student Attitudes and Student Actions on the success of the Clean and Healthy Living Behavior (PHBS) program

There were a total of 24 elementary schools that were measured by student knowledge with each elementary school sampling between 9, 10, or 12 students according to the willingness of the number of students as respondents. The results were obtained as follows

**Table 4. Student Knowledge, Attitudes, and Actions Per Respondent**

Yes	Student Variables	Factor	Result		Mean
			N	%	
1	Student knowledge				
	Tall		127	52,5	24,8
	Low		115	47,5	
2	Student attitude				
	Positive		107	44,2	54,5
	Negative		135	55,8	
3	Student actions				
	Good		151	62,4	10,9
	Less		91	37,6	

Based on table 4, the results were obtained that the majority of students had high knowledge 52.5%, negative student attitudes 55.8%, and the majority of good actions 62.4%. The results per respondent were converted to the results of the knowledge, attitudes and actions of students per each school and then tested for simple logistic regression based on simple normal undistributed data on the success of PHBS obtained the following results.

**Table 5. Influence of Student Factors With the Success of PHBS in Schools**

Yes	Student Factor	The Success of PHBS		Total	p-value
		Case (Less Successful)	Control Succeed		
1	Student knowledge				
	Low	5 (45,5%)	6 (54,5%)	11 (100,0%)	0,682
	Tall	7 (53,8%)	6 (46,2%)	13 (100,0%)	
2	Student attitude				
	Negative	6 (42,9%)	8 (57,1%)	14 (100,0%)	0,511
	Positive	6 (60,0%)	4 (40,0%)	10 (100,0%)	
3	Student actions				
	Less	8 (88,9%)	1 (11,1%)	9 (100,0%)	0,014
	Good	4 (26,7%)	11 (73,3%)	15 (100,0%)	
	Total	12 (100,0%)	12 (100,0%)	24 (100,0%)	

Based on table 5, it was found that the variables of student knowledge and student attitudes had no effect on the success of PHBS in schools ( $p$ -value  $>0.25$ ). Student action variables have an effect on the success of PHBS in schools ( $p$ -value  $<0.25$ ). The student's action variable becomes the candidate variable that will be included in the multivariable analysis.



### The influence of teacher factors consisting of teacher knowledge, teacher attitudes and teacher actions on the success of the Clean and Healthy Living Behavior (PHBS) program

There are a total of 24 elementary schools that are measured by student knowledge with each elementary school sampled 1 teacher of homeroom teacher in grade V or the person in charge of UKS as a respondent. The results were obtained as follows:

**Table 6. Knowledge, Attitudes and Actions of Teachers**

Yes	Teacher Variables	Factor	Result		Mean
			n	%	
1	Teacher knowledge				
	Tall		16	66,7	20,6
	Low		8	33,3	
2	Teacher's attitude				
	Positive		16	66,7	42,9
	Negative		8	33,3	
3	Teacher actions				
	Good		12	50,0	52,2
	Less		12	50,0	

Based on table 6, the results were obtained that the majority of teachers' knowledge was in the high category of 66.7%. The attitude of the majority of teachers is positive 66.7%. The teacher's actions are at 50% good and 50% less.

**Table 7. Influence of Teacher Factors with the Success of PHBS in Schools**

Yes	Teacher Factor	The Success of PHBS		Total	p-value
		Case (Less Successful)	Control (Successful)		
1	Teacher knowledge				
	Low	5 (62,5%)	3 (37,5%)	8 (100,0%)	0,390
	Tall	7 (43,8 %)	9 (56,3%)	16 (100,0%)	
2	Teacher's attitude				
	Less	5 (62,5%)	3 (37,5%)	8 (100,0%)	0,390
	Enough	7 (43,8 %)	9 (56,3%)	16 (100,0%)	
3	Teacher actions				
	Less	9 (75,0%)	3 (25,0%)	10 (100,0%)	0,020
	Enough	3 (25,0%)	9 (75,0%)	14 (100,0%)	
Total	12 (100,0%)	12 (100,0%)	24 (100,0%)		

Based on table 7, it was found that the variables of teacher knowledge and teacher attitude had no effect on the success of PHBS in schools (p-value >0.25). The teacher's action variable had an effect on the success of PHBS in schools (p-value <0.25) and became a candidate in the multivariate test.

### The Influence of School Support Factors consisting of Facilities, Infrastructure and Environmental Cleanliness on the Success of the Clean and Healthy Living Behavior (PHBS) program

School support in the form of facilities, infrastructure and cleanliness of the school environment is measured by observation sheets. The results were obtained as follows:

**Table 8. School Environmental Facilities, Infrastructure and Cleanliness**

Yes	School support variables	Category		Mean
		Less	Good	
1	Means	8 (33,3%)	16 (66,7%)	33
	School Health Unit (UKS)	8 (33,3%)	16 (66,7%)	7,7
	Toilet	8 (33,3%)	16 (66,7%)	8,4
	Garbage disposal	5 (20,8%)	19 (79,2%)	9,8
	Handwashing facilities	3 (12,5%)	21 (87,5%)	3,7
	Canteen	6 (25,0%)	18 (75,0%)	3,4
2	Infrastruktur	5 (20,8%)	19 (79,2%)	27,4
	Water	3 (12,5%)	21 (87,5%)	6,6
	Poster PHBS	5 (20,8%)	19 (79,2%)	20,8
3	Environmental Cleanliness	3 (12,5%)	21 (87,5%)	8,8

Based on table 8, the results were obtained that the majority of UKS facilities, toilets, waste disposal, hand washing, and canteens were good. The facility with the lowest percentage of handwashing facilities is 12.5%. Infrastructure is already available well, but water infrastructure still has the lowest percentage of 12.5%. The majority of environmental cleanliness is also quite clean 87.5%. School support consisting of facilities, infrastructure, and environmental cleanliness was cross-tabulated with the success of PHBS. Bivariate analysis was performed by simple logistic regression test.

**Table 9. Effect of School Support on PHBS Success**

Yes	School support	The Success of PHBS		Total	p-value
		Case (Less Successful)	Control (Successful)		
1	Means				
	Less	7 (87,5%)	1 (12,5%)	8 (100,0%)	0,022
	Good	5 (31,3%)	11 (68,8%)	16 (100,0%)	
2	Infrastruktur				
	Less	5 (100,0%)	0 (0,0%)	5 (100,0%)	0,999
	Good	7 (36,85)	12 (63,2%)	19 (100,0%)	
3	Environmental cleanliness				
	Less	2 (66,7%)	1 (33,3%)	3 (100,0%)	0,544
	Enough	10 (47,5%)	11 (52,4%)	21 (100,0%)	
	Total	12 (100,0%)	12 (100,0%)	24 (100,0%)	

Based on table 9, it was found that the variables of infrastructure and environmental cleanliness had no effect on the success of PHBS in schools (p-value >0.25). The means variable had an effect on the success of PHBS in schools (p-value <0.25) and became a candidate in the multivariate test.

### **The Influence of Parental Support Factors on the Success of the Clean and Healthy Living Behavior (PHBS) program**

Parental support consists of the participation of parents of students in the implementation of PHBS and reminders to do PHBS measured by questionnaires filled out by teachers. The results were obtained as follows:



**Table 10. Parental Support**

Yes	Parental Support Variables	Category		Mean
		Less	Good	
1	Parental participation in the implementation of PHBS	0 (0,0)	24 (100,0)	1
2	Parental attention	0 (0,0)	24 (100,0)	2
	Parental support	0 (0,0)	24 (100,0)	3

All elementary schools have received support from parents of students in the context of implementing the PHBS program.

**Table 11. The Effect of Parental Support on the Success of PHBS**

Yes	School support	The Success of PHBS		p-value
		Case Successful	(Less Control Successful)	
1	Parental participation in the implementation of PHBS			1,00
	Less	-	-	
	Good	12 (50,0)	12 (50,0)	
	Total	12 (50,0)	12 (50,0)	
2	Parental attention	-	-	1,00
	Less			
	Good	12 (50,0)	12 (50,0)	
	Total	12 (50,0)	12 (50,0)	

Based on table 11, it was found that there was no significant influence of parental support variables on the success of PHBS so that parental support variables

### **The Influence of Puskesmas Support Factors consisting of Teacher Knowledge, Teacher Attitudes and Teacher Actions on the Success of the Clean and Healthy Living Behavior (PHBS) program**

Puskesmas support is measured by counseling or training on PHBS in schools and the role of puskesmas in providing immunizations. The results of the study are as follows.

**Table 12. Health Center Support**

Yes	Puskesmas Support Variables	Category		Mean
		Less	Enough	
1	Counseling or training on PHBS	1 (4,2)	23 (95,8)	2,9
2	Immunization Program	3 (12,5)	21 (87,5)	3,6
3	Puskesmas Support	5 (20,8)	19 (79,2)	6,5

Based on table 12, the results were obtained that the majority of puskesmas support in providing counseling or training on PHBS was enough 23 (95.8%), sufficient in providing immunization 21 (87.5%), so the majority of puskesmas support in the implementation of PHBS was quite 19 (79.2%).

**Table 13 The Effect of Parental Support on the Success of PHBS**

Yes	School support	The Success of PHBS		p-value
		Case (Less Successful)	Control (Successful)	
<b>1</b>	Counseling or training on PHBS			1,00
	Less	1 (8,3)	0 (0,0)	
	Good	11 (91,7)	12 (100,0)	
	Total	12 (100,0)	12 (100,0)	
<b>2</b>	Immunization program			0,544
	Less	2 (16,7)	1 (8,3)	
	Good	10 (83,3)	11 (91,7)	
	Total	12 (100,0)	12 (100,0)	

Based on table 13, it was found that the variables of support for health centers in providing training and immunization had no effect on the success of PHBS.

### **Predictive Index of PHBS Success at Sikumana Elementary School, Kupang**

The results of the simple logistics regression test on 13 variables independent of the PHBS success factor at Sikumana elementary school, Kupang were obtained if the p value was  $< \alpha$  (0.25), then the variable was a candidate that could be entered for further analysis with multiple logistics regression analysis. For more details, see table 5.13 below:

**Table 14. Results of Simple Logistic Regression Analysis of PHBS Success Factors in Elementary Schools in the Working Area of the Sikumana Health Center, Kupang City**

Yes	Variable	<i>p value</i>	Information
<b>1</b>	Student knowledge	0,682	Non-Candidate
<b>2</b>	Student attitude	0,511	Non-Candidate
<b>3</b>	Student actions	0,014	candidate
<b>4</b>	Teacher knowledge	0,390	Non-candidate
<b>5</b>	Teacher's attitude	0,390	Non-Candidate
<b>6</b>	Teacher actions	0,020	Candidate
<b>7</b>	Means	0,022	Candidate
<b>8</b>	Infrastructure	0,999	Non-candidate
<b>9</b>	School Environment Cleanliness	0,544	Non-candidate
<b>10</b>	Parent Involvement	1	Non-candidate
<b>11</b>	Parental attention	1	Non-Candidate
<b>12</b>	Training and Counseling	1	Non-candidate
<b>13</b>	Immunization program	0,544	Non-candidate

Table 14 above shows that the variables to be included in the double logistics regression test are student actions, teacher actions, and means.

### Results of Analysis with Multiple Logistic Regression Test

Simultaneous testing using a double logistics regression test by entering eight eligible variable candidates aimed at determining what variables will be included as a predictive index of PHBS success in elementary schools in Sikumana District, Kupang. The results of the multiple logistics regression test can be seen in Table 5.14 below:

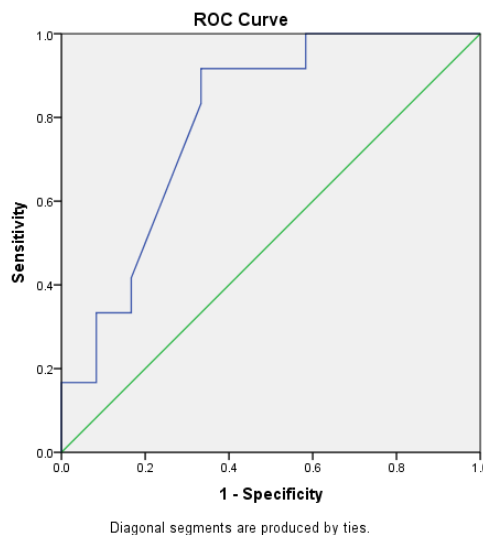
**Table 15. Results of Multiple Regression Analysis of PHBS Success Factors in Elementary Schools in the Working Area of the Sikumana Health Center, Kupang City**

Variable	Coefficient(B)	P	OR	95% CI
<b>Student actions</b>	Less (reference)	-	-	-
	Good	2,963	0,043	19,362
<b>Teacher actions</b>	Less(reference)	-	-	-
	Good	2,220	0,139	9,207
<b>Means</b>	Less (Reference)	-	-	-
	Good	1,116	0,471	3,051
<b>Constant</b>	- 10,301	0,009	0,000	-

Table 15 above shows the final results of the multivariate analysis. Based on these results, there is one significant variable and is a predictive indicator of the success of PHBS, namely the student action variable because the p-value of  $0.043 < 0.05$  means that it has a significant influence on the success of PHBS so that the student action variable will be included in the index formula while the variables of teacher action and facilities are not significant in affecting the success of PHBS because the p-value  $> 0.05$ .

### PHBS Predictive Success Index Cutoff

The results of multivariable analysis to calculate the values of sensitivity and specificity as well as the accuracy of the model created and to obtain the cut off value of the index used the ROC curve in Figure 1 below:

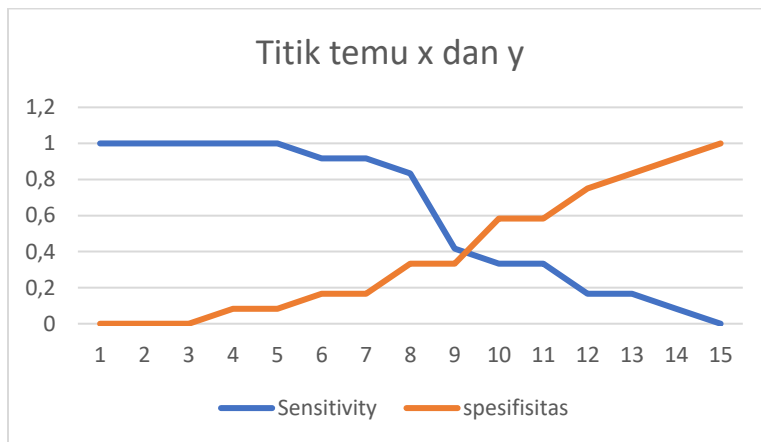


**Picture 1. ROC Curve of Student Actions on PHBS Success**

Figure 1 above can be seen with an accuracy value of 79%, which means that the model has *fair quality*, which is quite good in predicting the success of PHBS in schools with a p-value of 0.015, a sensitivity value of 66.70%, and a specificity of 90.9%. The probability value is obtained from the cut-off point of the sensitivity and specificity value of 11.20, so that the calculation of the cut-off value of the index from the probability formula is as follows:

**Table 16. Calculation of Sensitivity and Specificity Values to find Probability values**

Positive if Greater Than or Equal To a	Sensitivity	Specificity
3.00	1.000	1.000
5.00	1.000	.917
6.50	1.000	.833
7.50	1.000	.750
8.50	1.000	.583
9.50	.917	.583
10.30	.917	.333
10.80	.833	.333
11.20	.417	.167
11.55	.333	.167
11.85	.333	.083
13.00	.167	.083
15.50	.167	.000
20.50	.083	.000
25.00	.000	.000



**Picture 2. Sensitivity value cut-off point to view probability value**

Table 16 and Figure 2 above can be seen that the y value is 11.20, derived from the cut-off point between the sensitivity and specimenization values in Figure 2.

The calculation of the cut off index is obtained using the following equation:

Information:

y : Probability

z : Cut off index

E : Natural number (2,7)

$$y = \frac{1}{1 + e^{-z}}$$

From the equation above, the calculation of the *cut off* index in this study can be seen below:

$$11.20 (1+e^{-z}) = 1$$

$$11.20 + 11.20 e^{-z} = 1$$

$$11.20 e^{-z} = 1 - 11.20$$

$$11.20 e^{-z} = -10.2$$

$$e^{-z} = -0.911$$

Example  $e = 2$

$$2^{-z} = -0.911$$

Or

$$7^{-z} = -0.911$$

$$1/7z = -0.911$$

$$1 = -0.911 * 7z$$

$$z = 2.355$$

So that the value of  $z$  or the value of the cut off index = 2.355 is obtained thus:

1. If the index score  $< 2.355$ , it means that there is a low risk of experiencing the success of PHBS.
2. If the index score  $\geq 2.355$ , it means that there is a high risk of experiencing the success of PHBS

### PHBS Success Predictive Index Formula

Based on the results of the double logistics regression test, the predictive index formula for Student Action can be compiled as follows:

$$\text{PHBS Predictive Success Index} = (-10,301 + 2,963 \times \text{student actions}^{(\text{good})})$$

So that the score in the variable category can be determined as follows:

**Table 17. Student Action Variable Category Scores**

Variable	Category	Score
Student actions	Less	0
	Good	1

A model for predicting the results of the PHBS success variable variable test can be created to predict the risk of PHBS success. The results in detail can be seen in Table 18 below:

**Table 18. Predictive Index of Success Risk of PHBS in Elementary Schools in the Working Area of the Sikumana Health Center, Kupang City**

Yes	Student actions	Information
1.	Less	Low potential for success
2.	Good	High potential for success

### *Predictive Index of the Risk of PHBS Success in Schools*

Table 18 above can be concluded that elementary schools that have good student actions are included in the group of schools that have high potential to succeed PHBS

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### **The influence of student factors on the success of the implementation of the PHBS program in schools**

The actions of students in the implementation of PHBS with the lowest percentage of achievement are on the points of healthy snacks and preventing dengue fever. This is shown by still 37.6% of students who have never brought provisions to school and 44.2% of students still leave if there is waterlogging at school. This is in line with previous research that stated that healthy snacks are the most unused indicator (Lina, 2016). The majority of respondents' knowledge related to PHBS is high, but there are still many points of definition of PHBS and related to dental hygiene that are not correct in answering. Knowledge is the result of each individual's knowledge of the objects he or she gets through the sensory tools they have. From the results of these senses, individuals can produce knowledge that is influenced by how often the individual pays attention to an object (Notoatmodjo, 2010).

Knowledge is quite good for students because of the role of counseling and education that has been carried out for a long time such as the existing regulations on PHBS in 2010. The attitude of the students is good and the majority agree and support the implementation of PHBS in schools, but the point that is still low is related to the attitude of students towards the prevention of dengue fever because they still do not agree that puddles can be a breeding ground for mosquitoes. Students' knowledge and attitudes are good because the topic of PHBS is common, but students' actions can be influenced by various things such as facilities, infrastructure, and examples from the environment. Therefore, student actions are related to the implementation of PHBS in schools.

### **The influence of parental support on the successful implementation of the PHBS program in schools**

Parental support in this study obtained good results, but this result is different from the previous study which stated that the achievement of parental support was in the classification of lack (Afnilda, 2010). Parental support in the implementation of a clean and healthy lifestyle (PHBS) is a motivation for students to do PHBS. Motivation is very important in an activity, because it is a motivator to act. Motivation is to encourage humans to act, determine the direction of actions, to achieve goals and select actions, namely which actions to be done. Based on the results mentioned above, it is clear that without good motivation from the student's parents, the willingness and seriousness of students to maintain cleanliness will be reduced. Children will learn directly from their environment such as from home, namely their parents (Lina, 2016). Parents of students are one of the important components of the realization of schools that implement PHBS.

### **The influence of teacher factors on the success of the implementation of the PHBS program in schools**

Children will learn directly from their environment as from their teachers (Lina, 2016). Teachers are an important part of the implementation of PHBS in schools by fostering the activities of the School Health Unit (UKS) (Lina, 2016). The knowledge and attitude of the teacher are good. Teachers' actions are related to the implementation of PHBS in schools. This is in line with previous research which stated that the role of teachers is related to the implementation of the PHBS program (Diana et al., 2013). Based on the results of the chi-square test, it showed that teachers' knowledge was not related to the implementation of PHBS in schools ( $p$  value  $0.386 > 0.05$ ), teachers' attitudes were not related to the implementation of PHBS in schools ( $p$ -value  $0.386 > 0.05$ ). This is in line with previous research which stated that there is no relationship between teachers' attitudes and the implementation of PHBS programs in schools (Diana et al., 2013). Meanwhile, teachers' actions were significantly related to the implementation of PHBS in schools ( $p$ -value  $0.014 < 0.005$ ). The actions of teachers that are still lacking are that there are still many teachers who do not bring



provisions to school, still do not use the teacher's toilet, and have not sorted waste into organic or organic waste and have not participated in seminars or counseling on school activities regarding PHBS. The tendency of children to imitate the behavior of adults, school teachers are the second closest adults to students. Even students can idolize and believe what the teacher conveys (Diana et al., 2013).

### **The Effect of School Support on the Success of the Implementation of the PHBS Program in Schools**

The results are that the majority of elementary schools (SD) in the work area of the Sikumana Health Center have good facilities and infrastructure, in line with previous research in Talawi District (Afnilda). The activities of the School Health Unit (UKS) and the available facilities are important for cooperation with health workers to receive and practice PHBS. UKS, it is hoped that health promotion activities in schools will be more effective to cultivate clean and healthy living behaviors so that students can and are able to create optimal growth and development (Promkes Center of the Ministry of Health of the Republic of Indonesia, 2011).

School facilities or facilities that are closely related to students' PHBS (Rorimpandei, 2013). Good infrastructure or facilities are believed to have a positive effect on the cleanliness and health of students. There are various problems with health facilities and infrastructure that are not supportive in the implementation of clean and healthy living, such as UKS which still lacks height measuring devices, bed covers, and the availability of P3K equipment. In the aspect of toilets, there is still no separation between men and women and toilet cleanliness. In addition, there is no availability of garbage cans equipped with lids in each room, waste disposal, wastewater disposal from watertight materials, and closed wastewater channels. The availability of sinks, faucets, close access, and the use of sinks for washing hands is also still lacking, namely 8.3%.

The availability of canteens is also a matter of concern because 25% of schools still do not have stalls/canteens. Water quality ranging from tasteless, colorless, and odorless water also still needs to be considered. PHBS posters are also important because in this study there is still a lack of posters that are easy to see, easy to read, in strategic places, smoking ban posters, and healthy snack posters. In the cleanliness of the environment, the aspects of classroom lighting, the cleanliness of places of worship, the cleanliness of the canteen, and the cleanliness of the sink. This is in line with previous research which stated that facilities and infrastructure have an impact on students' health which is often disturbed and causes students to be affected by diseases such as dengue fever and diarrhea (Suryani, 2017).

### **The effect of puskesmas support on the success of the implementation of the PHBS program in schools**

The support of the health center in this study was obtained in accordance with the previous research that the support of the health center has played a role in providing counseling and training about PHBS but is still lacking in providing immunization programs. The support of the health center is a very important factor in motivating children in efforts to improve cleanliness. Puskesmas is an important part of knowing the health of students (Afnilda, 2010). Based on the results of the chi-square test, it was shown that there was no relationship between the support of the health center in providing PHBS counseling or training and providing immunization with the implementation of PHBS in schools ( $p$  value  $< 0.05$ ).

### **PHBS success index in schools**

The results of the influence test and as a determinant of the success index of the PHBS implementation program in schools in the work area of the Sikumana Health Center, are explained by the main factors, namely facilities, infrastructure, and environmental cleanliness. This shows that a behavior is not only a factor of knowledge and attitude for the occurrence of behavior as *a predisposing factor*. In addition to *predisposing* factors, there are enabling factors, namely the availability of health service facilities and infrastructure and the ease of achieving them, and the reinforcing factors are the attitudes and behaviors of health workers. School health efforts in every school are a tool or means that can be used to stimulate growth, child development, and improve skills, abilities and knowledge about health education. School age is a golden age to instill the value of clean and healthy living behaviors (PHBS). The impact of PHBS coaching in schools is the creation of clean and healthy schools so that students, teachers, and the community in the school environment are protected from various disturbances and disease threats.

#### 1. Wash your hands with soap

Soap and other handwashing infrastructure must be a concern for the success of PHBS. Knowledge related to handwashing and attitudes is supportive, but various suggestions and infrastructure need to be improved.

#### 2. Cakes in the School Cafeteria

Indicators of the availability of healthy canteens and posters in motivating healthy snacks to bring provisions, need to be encouraged by schools.

#### 3. Dispose of garbage in the trash can

Waste in schools needs to be provided with a close, per class, and closed garbage bin as well as waterproof materials. This is related to the next stage, namely the separation of waste into organic and inorganic.

#### 4. Exercise on a regular basis

The sports aspect is good enough because sports have become a curriculum in all schools.

#### 5. Weigh and measure height

Weighing and measuring height facilities are needed, especially with the provision of School Health Units (UKS).

#### 6. No smoking

Nicotine as a harmful substance in cigarettes. There is a need for prevention in students related to smoking. Smoking ban posters are necessary as an affirmation of smoking prevention in elementary school students. However, this must be supported by example and support from parents and teachers.

#### 7. Urinate and defecation in the toilet/toilet

The availability of latrines in schools is still not enough to separate boys and girls and ensure that the cleanliness of toilets and the needs of toilet infrastructure for both teachers and students must continue to be improved.

#### 8. Eradicating mosquito larvae

The knowledge, attitudes and actions of students and teachers towards efforts to eradicate mosquito larvae need to be improved related to the prevention of inundation in schools to prevent mosquito larvae.

## Conclusion

The success of the Clean and Healthy Living Behavior (PHBS) program in schools is primarily driven by students' knowledge-based actions, teacher involvement, and school facilities, while parental and health center support showed limited impact, as evidenced by the predictive index formula (PHBS Success =  $-10.301 + 2.963 \times \text{student actions}$ ). Future research should focus on long-term student and teacher interventions (e.g., peer education, training modules), investigate gaps in parental and health center engagement through mixed-methods studies, validate the predictive index in diverse settings, and explore technology-based monitoring tools to enhance PHBS sustainability and effectiveness.

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