

Training On Dengue Haemorrhagic Fever Surveillance System And Case Mapping For Public Health Center Level Dengue Hemorrhagic Fever Program Managers In Bogor City In 2022

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ABSTRACT

Bogor City has The incidence rate is 21.4 per 100,000 population, but the CFR is sufficient tall by 2.49%. So from That need exists enhancement knowledge about surveillance of DHF program holders in Bogor City in 2022. Method : Study design in research dengue operations is studies non-experimental pre-test and post-test design. Primary data begins from pretest-posttest results to DHF program manager with use questionnaire while Skills mapping taken from sheet observations that have made. While the secondary data obtained from results analysis Bogor City Health Office profile. Data analysis was performed in a manner univariate, bivariate and multivariate. Result: yes difference knowledge Community Health Center DBD program holders after done training in matter knowledge DHF surveillance (Pvalue < 0.05). There is difference enhancement Skills in do mapping DHF cases in DHF program holders at Puskesmas after done training in do mapping with use application (Pvalue <0.05), and presence enhancement in do data interpretation and determine stratification area DHF cases (Pvalue <0.05). Conclusion: improvement knowledge and skills DHF program holders are carried out with use appropriate intervention , so DHF program holders can do system good surveillance in prevention and control DHF.

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1. INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is an infection caused by the dengue virus, which is transmitted through the intermediary vector mosquitoes *Aedes aegypti* and *Aedes albopictus* [1]. The symptoms include high fever, bleeding, liver enlargement, and in severe cases, it can lead to circulatory failure. The diagnosis of DHF is established through clinical symptoms and laboratory results indicating a decrease in platelet count < 100,000/mm³ and plasma leakage indicated by an increase in hematocrit > 20% (Ministry of Health, 2017).

The incidence of DHF has been rapidly increasing [2]. According to WHO, in 2019, there was an eight-fold increase in the cases compared to two decades ago. In 2019, it was recorded that 5.6 million people were infected with the virus, with a significant number of deaths (WHO, 2020).

According to the Ministry of Health, in the past five years, an average of 121,191 cases of DHF were reported annually, with 909 deaths. According to the Ministry of Health, in 2021, West Java had the highest number of cases and deaths in Indonesia, with 23,206 cases of DHF and 208 deaths. West Java has 27 districts, all of which are endemic areas, meaning that cases have been reported every year for the past three years.

In 2021, Bogor City recorded 536 cases with 7 deaths and a Case Fatality Rate (CFR) of 1.3. In 2022, until September, 1,147 cases and 6 deaths were reported (Bogor City Health Office, 2022). The high rainfall in Bogor City has contributed to the rapid growth of *Aedes aegypti* mosquito colonies. As a result, the target of achieving 94.04% larval-free status by September 2022 has not been met (Bogor City Health Office, 2022).

Based on the surveillance system evaluation in 2022, several factors have contributed to the ineffective DHF surveillance system in Bogor City [3]. Firstly, most DHF cases are detected passively, meaning that patients seek healthcare services before being diagnosed. Only 25% of primary health centers conduct active case detection. Furthermore, the knowledge level of DHF program managers in primary health centers regarding surveillance activities is inadequate [4]. This is partly due to frequent turnover of DHF program managers, resulting in new staff members who have not been exposed to information on surveillance activities. The ability of the staff to analyze and interpret data is also lacking, preventing the available DHF data from being utilized effectively for decision-making. Additionally, there are delays in reporting DHF cases from hospitals, leading to delayed contact investigations and inaccurate targeting. Delayed confirmation of diagnoses due to a lack of NS1 examination reagents hampers early detection of DHF.

The objective of this Operational Research is to enhance the capacity of DHF Program Managers at the primary health center level in implementing DHF surveillance in Bogor City and improve the skills of healthcare workers in mapping DHF cases.

The benefits of this research for the Bogor City Health Office are the improvement in timely reporting, diagnosis, and contact investigations [5]. This accuracy can help break the chain of DHF transmission. The benefits for the community and other sectors include a decrease in DHF cases and deaths. For students, this operational research can serve as a source of information for further studies on DHF.

2. LITERATURE REVIEW

Operational Research

a. Definition of Operational Research

The World Health Organization (WHO) defines operational research as the systematic use of research for decision-making in a program to achieve specific goals [6]. Operational research provides evidence for policymakers and managers to improve program operations (WHO, 2003).

According to the handbook for family planning Operation research design, operational research is a way to identify problems and find solutions. Operational research can be defined as a continuous process consisting of five steps: problem identification and diagnosis, strategy selection, strategy experimentation and evaluation, information dissemination, and information utilization.

b. Objectives of Operational Research

The objective of operational research is to provide the necessary information to improve existing activities or plan future activities. It aims to provide practical solutions to problem situations and viable alternatives (handbook for family planning Operation research design, 1991).

c. Categories of Operational Research

Operational research, according to the handbook for family planning Operation research design, is categorized based on:

Exploratory or diagnostic studies, which focus on factors that influence the effectiveness, efficiency, and quality of a program. These studies use retrospective or cross-sectional approaches.

Field intervention studies, which experiment with a new system to solve a problem.

Evaluation studies, which assess an ongoing program.

d. Steps of Operational Research

1) Problem Identification

Identify the problems occurring in an ongoing program. Initially, conduct a problem situational analysis and evaluate the surveillance system. The approach to selecting the problem to be researched can be aided by system analysis, clustering of subsystems, and their determining components and outputs.

One example of identifying root problems is using a Cause and Effect Diagram, also known as a Fishbone or Ishikawa Diagram. Another method is problem tree analysis.

2) Select Problem Solution Strategy

After prioritizing the problems and their causes in step 1, determine a problem solution activity. In determining the problem solution, it is common to modify the existing healthcare management.

- 3) Develop Operational Research Proposal for Testing the Identified Health Problem Solutions
- 4) Conduct Intervention Studies for Health Problem Solutions
- 5) Present and Disseminate Research Findings

e. Factors Affecting the Validity of Research

The factors that affect the validity of research are as follows:

1) History

History refers to conditions that occur during the research and influence the research outcome (history effect). These conditions are not part of the research, are unplanned, and unanticipated.

2) Selection

Selection refers to differences between subjects selected for the control group and the intervention group.

3) Testing

Pre-testing tends to influence post-testing. Generally, knowledge improves due to pre-testing.

4) Instruments

Changes in the instruments for measurement/data collection between pre-test and post-test can affect the intervention's effect.

5) Maturation

Maturation often occurs in studies with a sufficiently long observation period. Over time, individuals tend to acquire more knowledge, become wiser, or trained groups become bored or fatigued.

6) Mortality

Mortality refers to dropouts or lost to follow-up that affects research outcomes. This occurs when the drop-out subjects differ from those who can still be contacted.

2. DBD Surveillance

Dengue Surveillance is the systematic and continuous process of observing, collecting, processing, analyzing, interpreting, and presenting data and information to policymakers, health program implementers, and relevant stakeholders about the dengue situation and the conditions that influence the increase and transmission of the disease (determinants) [7]. The purpose is to enable effective and efficient control measures (Ministry of Health, 2017).

Data processing and presentation at the city/district level include monitoring the monthly situation of dengue fever (DD), dengue hemorrhagic fever (DHF), and suspected dengue syndrome (EDS) according to health centers, reporting individual basic data of DD, DHF, and EDS patients, including several core activities for prevention and control on a monthly basis, and monthly reporting containing the number of deaths/cases of DD, DHF, and EDS, including several core activities for prevention and control every month, as well as reporting to the provincial Health Office using the K-DBD and P-DBD forms.

3. Training

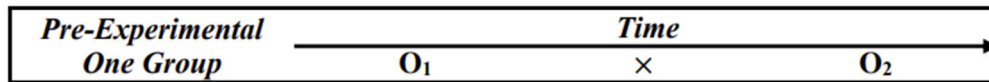
Training is a series of individual activities aimed at systematically improving skills and knowledge to enable professional performance in their respective fields [8]. Training is a learning process that enables employees to perform their current jobs in accordance with standards. Training provides an environmental platform for employees to acquire or learn attitudes, abilities, skills, knowledge, and specific behaviors related to their jobs [9]. Training is a systematic process of changing employee behavior to achieve organizational goals [10]. Training is related to the skills and abilities of employees to perform their current jobs. Based on the above definitions, training is a process of enhancing employee competence and can train their abilities, skills, expertise, and knowledge to carry out work effectively and efficiently to achieve goals in a company.

The objectives of training conducted by a company are to increase productivity, improve quality, support human resource planning, enhance morale, provide indirect compensation, improve health and safety at work, prevent the obsolescence of personnel's abilities and knowledge, and enhance the

development of personnel's abilities and expertise. Training aims to enhance mastery of theory and skills in making decisions related to activities aimed at achieving goals [11].

3. METHOD

The purpose of this operational research is to examine the impact of training on the change in knowledge of healthcare workers and health volunteers regarding dengue fever. It also aims to improve the speed of case reporting and accelerate contact investigation. The design used is a non-experimental pre-test and post-test design [12].



Explanation:

O1: Capacity of the dengue fever program managers to conduct dengue surveillance activities and mapping of high-risk areas before training.

X: Training in the form of presenting materials on dengue surveillance and practicing mapping of high-risk dengue occurrence areas.

O2: Capacity of the dengue fever program managers to conduct dengue surveillance activities and mapping of high-risk areas after training.

This operational research was conducted in all health centers in Bogor City, starting from early November 2022 until December 2022. The research population in this operational research consists of all dengue fever program managers in health service units that are part of the surveillance system network in Bogor City. There are 25 health centers and 21 hospitals that collaborate with the Bogor City Health Office. The research sample in this operational research consists of all dengue fever program managers in Bogor City, totaling 25 individuals. The selection is based on the consideration that health centers are more involved in disease control and prevention activities for Dengue Hemorrhagic Fever.

Primary data will be obtained through pretest-posttest results from dengue fever program managers using questionnaires, while mapping skills will be assessed using observation sheets that have been prepared. Secondary data will be obtained from the analysis of the Bogor City Health Office profile, the DBD case register manual book, epidemiological investigation reports, SILANTOR reports, and SKDR reports.

In this research, there are two types of primary data collected by the researchers, namely data on the knowledge of health center dengue fever program managers regarding surveillance systems and the availability of mapping for high-risk dengue cases. The methods of obtaining this data are as follows: Measuring changes in knowledge of dengue fever program managers at the health center level regarding the surveillance system and mapping of dengue cases. Enhancing the mapping skills of dengue fever program managers to create dengue case mapping. Ability to interpret data and determine high-risk areas for dengue cases.

Data processing will be carried out using the following steps:

Editing: Checking the collected data for completeness, clarity of answer meanings, consistency, and errors in the questionnaire.

Coding: Assigning codes to each assessment item to facilitate further data tabulation and analysis.

Data Entry: Entering the data based on the predetermined codes into the computer for further processing.

Tabulating: Grouping the data according to the variables to be studied for easier summarization, arrangement, presentation, and analysis.

4. RESULTS AND DISCUSSION

a. Univariate Analysis

Univariate analysis is conducted to understand the characteristics of respondents (gender, length of employment, and educational level), as well as the facilities and infrastructure for mapping. The proportions can be seen in the following table:

1) Characteristics of Participants in the Capacity Building Training for DBD Program Holders.

Table 1 Proportions of Characteristics of Participants in the Training for DBD Program Holders at Health Centers in Bogor City in 2022.

Variable	n	%
Gender		
Male	2	8,33
Female	22	91,67
Working Period in the DHF Program		
< 1 year	19	79,17
1-10 Years	3	12,50
>10 Years	2	8,33
Education		
D3 Kesling	21	87,5
S1	3	12,5

From the table above, we can see that the majority of training participants are women, accounting for 91.67%, with the majority of them having worked as DBD program holders for less than 1 year (79.17%). The highest educational background among DBD program holders is a D3 degree in Environmental Health (87.5%).

2) Training Participants' Knowledge in Using Mapping Applications

Table 2 Training Participants' Knowledge in Using Mapping Applications

Variable	n	%
Yes	0	0
No	100	100

From the data above, it is found that none of the participants are familiar with the mapping application and how to use it.

3) Pretest and Post-test Results of Knowledge for DBD Program Holders at Health Centers in Bogor City.

Table 3 Proportions of Pretest and Post-test Results of Knowledge for DBD Program Holders at Health Centers in Bogor City in 2022.

Variable	Mean	Std Dev	Min	Max
Pretest Value	47,5	11,13	30	60
Post Test Value	78,95	10,63	55	90

From the data above, it is found that the lowest pretest score is 30, and the highest is 60, with a mean of 47.5 and a standard deviation of 11.13. On the other hand, the lowest post-test score is 55, with the highest being 90, with a mean of 78.95 and a standard deviation of 10.63.

4). Proportions of Skills Improvement for DBD Program Holders at Health Centers in Mapping DBD Cases in Bogor City in 2022.

Table 4 Proportions of Skills Improvement for DBD Program Holders at Health Centers in Mapping DBD Cases in Bogor City in 2022.

No	Fasyankes	Name of DHF Program Holder	Capability in Mapping Cases
1	Puskesmas Bogor Selatan	Anita Siti Hanifah, Amd. Kes	Skilled

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2	Puskesmas Lawang Gintung	Ike Ratna Ardinarsih, A.md KL	Skilled
3	Puskesmas Cipaku	Ribka Mahardika , Amd. Kel	Skilled
4	Puskesmas Bogor Utara	Nurhanifa Latuconsina, S.K.M	Skilled
5	Puskesmas Warung Jambu	Dio Rida Ramadhani, Amd Kes	Skilled
6	Puskesmas Tegal Gundil	Eva Sifa Robitoh, Amd KL	Unskilled
7	Puskesmas Bogor Timur	Lamtiur Meilina, AmdKL	Skilled
8	Puskesmas Pulo Armyn	Wisnu Sukma Zakaria, AmdKes	Skilled
9	Puskesmas Bogor Tengah	Cut Desy Milasari, Amd KL	Skilled
10	Puskesmas Belong	Listya Noor Fitria, A.md KL	Skilled
11	Puskesmas Sempur	Ai Fitriani, Amd Kes	Skilled
12	Puskesmas Gang Aut	Anggi Septiani , Amd KL	Skilled
13	Puskesmas Merdeka	Eva Pupa Parlina, SKM	Skilled
14	Puskesmas Tanah Sareal		Skilled
15	Puskesmas Mekar wangi	Fitri Ananda Isnaini, Amd KL	Skilled
16	Puskesmas Kedung Badak		Skilled
17	Puskesmas Kayu Manis		Skilled
18	Puskesmas Sindang Barang	Annisa Endayani, STrKes	Skilled
19	Puskesmas Gang Kelor	Ratna Dewi Siagian , A.md KL	Skilled
20	Puskesmas Mulyaharja	Yuana Nuke H, A.md KL	Skilled
21	Puskesmas Pondok Rumput	Mony Margarina Nabella, A.md KL	Skilled
22	Puskesmas Pancasan	Salsabila Nur Fauziah , A.md Kes	Skilled
23	Puskesmas Pasir Mulya	Syavira Agita, A.mdKL	Skilled
24	Puskesmas Semplak		Unskilled

(Data source : Primer, 2022)

From the data above, it can be concluded that there are 2 training participants who are not skilled in mapping DBD cases after the intervention. This is because one participant is not skilled in using the mapping application, and one participant did not bring data, resulting in the inability to practice and assess their skills.

b. Bivariate Analysis

Bivariate analysis is an analysis used for two variables that are suspected to be related or correlated (Notoatmojo, 2010).

1) Relationship between the initial knowledge of DBD program holders based on gender, length of employment, and educational background

Table 5 Relationship between the initial knowledge of DBD program holders at Health Centers based on gender, length of employment, and educational background in Bogor City in 2022.

	Good		Not enough		P Value
	n	%	n	%	
Gender					
Male	0	0	2	100	0,0002
Female	14	63,64	8	36,26	(McNemar test)
Length of Time Working					
< 1 Year	3	15,79	16	84,21	0,0004
1-10 Years	3	100	0	0	(annova)
> 10 Years	2	100	0	0	
Educational background					
S1	0	0	3	100	0,1317
D3	8	38,10	13	61,90	(McNemar test)

From the data above, it is found that from the results of the pretest (assessment divided into two categories: good if the pretest score > 50 , and poor if ≤ 50), it is found that there are no male participants with a good score, and there are 2 participants with a poor score (100%). On the other hand, among female participants, 14 participants (63.64%) have a good initial knowledge, and 8 participants (36.36%) have a poor initial knowledge. With a p-value of 0.0002 (< 0.05), it can be concluded that there is a statistically significant relationship between a person's initial knowledge and gender.

Furthermore, from the data above, when examining the initial knowledge level of participants before the intervention in relation to the length of employment, it is found that among participants with less than 1 year of employment, 3 participants have good initial knowledge (15.79%), and 16 participants have poor initial knowledge (15.79%). For participants with 1-10 years of employment, 3 participants have good initial knowledge (100%), and for those with more than 10 years of employment, 2 participants have good initial knowledge (100%). With a p-value of 0.0004 (< 0.05), it is statistically concluded that there is a relationship between the initial knowledge level and the length of employment.

Based on the data above, when examining the initial knowledge level of participants before the intervention in relation to educational background, it is found that among participants with an S1 educational background, 3 participants have poor initial knowledge (100%), and among those with a D3 educational background, 13 participants have poor initial knowledge (61.90%), and 8 participants have good initial knowledge (38.10%). With a p-value of 0.1317, it is found that there is no statistically significant relationship between a person's initial knowledge and educational background.

2) Improvement in Knowledge of DBD Program Holders at Health Centers after the Intervention in Bogor City.

Table 6 Improvement in Knowledge of DBD Program Holders at Health Centers after the Intervention in Bogor City in 2022.

Variable	n	P Value
Negative	1	0,0001 (Paired T Test)
Positive	22	
Constant	1	

From the data above, it can be concluded that 22 participants experienced an improvement (positive rank) between the pretest and post-test, 1 participant had a decrease in score, and 1 participant remained the same. With a p-value of 0.0001 (< 0.05), it indicates a significant difference in the knowledge of DBD program holders before and after the intervention. Statistically, the results show that there is a correlation between the level of knowledge before and after the intervention.

3) Improvement in the level of knowledge of DBD program holders at health centers based on educational background.

Table 7 Improvement in Knowledge of DBD Program Holders at Health Centers based on Educational Background in Bogor City in 2022.

	S1		D3		P value
	n	%	n	%	
Increase	3	100	19	90,48	0,3768 Independent T Test
Down	0	0	1	4,76	
Constant	0	0	1	4,76	

From the data above, it was found that among the participants with a D3 educational background, 19 individuals (90.48%) experienced an increase in knowledge, 1 person remained the same (4.76%), and 1 person (4.76%) had a lower post-test score compared to the pretest. As for participants with an S1 educational background, all 3 individuals (100%) showed an increase in knowledge. With a p-value of 0.3768 (> 0.05), it indicates that statistically, there is no correlation between the improvement of knowledge among the DBD program holders and their educational background.

4) Increase in the level of knowledge among DBD Program holders based on Gender.

Table 8 Increase in Knowledge of DBD Program Holders in Puskesmas based on Gender in Bogor City, 2022.

	Male		Female		P value
	n	%	n	%	
Increase	2	100	20	90,92	0,9381 Independent T Test
Down	0	0	1	4,54	
Constant	0	0	1	4,54	

From the data above, it was found that among the male participants, 2 individuals (100%) experienced an increase in knowledge. As for the female participants, 20 individuals (90.92%) showed an increase in knowledge, 1 person remained the same (4.54%), and 1 person (4.54%) had a lower post-test score compared to the pretest.

With a p-value of 0.9381 (>0.05), it indicates that statistically, there is no correlation between the improvement of knowledge among the DBD program holders and their gender.

5) Increase in the knowledge of DBD program holders based on their duration of working as program holders.

Table 9 Increase in Knowledge of DBD Program Holders Based on the Duration of Working as DBD Program Holders in Bogor City, 2022.

	< 1 Year		1-10 Years		>10 Years		P value
	n	%	n	%	n	%	
Increase	18	94,74	2	66,67	2	100	0,3080 Annova Test
Down	1	3,33	0	4,54	0	0	
Constant	0	0	1	3,33	0	0	

From the data above, it was found that among participants with less than 1 year of working experience, 18 individuals (94.74%) experienced an increase in knowledge, and 1 person (33.33%) had a decrease in post-test scores. Among participants with 1-10 years of working experience, 2 individuals (66.67%) showed an increase in knowledge, and 1 person (33.33%) had the same post-test score as the pretest. Meanwhile, among participants with over 10 years of working experience, all 2 individuals (100%) experienced an increase in knowledge, and none had a decrease or the same score. With a p-value of 0.3080 (>0.05), it indicates that statistically, there is no correlation between the improvement of knowledge among the DBD program holders and their duration of working as program holders.

6) Relationship between initial mapping skills and gender, duration of working, and educational background among DBD program holders at Puskesmas.

Table 10 Relationship between Initial Mapping Skills and Gender, Duration of Working, and Educational Background among DBD Program Holders in Bogor City, 2022.

	Skilled		Unskilled		P Value
	n	%	n	%	
Gender					
Male	0	0	2	100	1,0000 (McNemar test)
Female	6	27,27	16	72,73	
Length of Time Working					
< 1 Year	1	5,26	18	94,74	0,0001 (annova)
1-10 Years	2	66,67	1	33,33	
> 10 Years	2	100	0	0	

Educational background					
S1	0	0	3	100	0,3173
D3	6	28,57	15	71,43	(McNemar test)

From the data above, it was found that there were no skilled male participants in conducting mapping before the intervention, while there were 2 (100%) male participants who were unskilled. For female participants, it was found that 6 (27.27%) were already skilled in conducting mapping before the intervention, and 16 (72.73%) were unskilled. With a p-value of 1.000 (<0.05), it can be concluded that there is no statistically significant relationship between mapping skills and gender.

Furthermore, based on the data above, when examining the skilled participants in mapping before the intervention in relation to their duration of working, it was found that among participants with less than 1 year of working experience, 1 person (5.26%) was skilled in mapping, and 18 people (94.74%) were unskilled. For participants with 1-10 years of working experience, 2 people (66.67%) were skilled in mapping, and 1 person (33.33%) was unskilled. Among participants with over 10 years of working experience, 2 people (100%) were skilled in mapping. With a p-value of 0.0001 (<0.05), it indicates that there is a statistically significant relationship between mapping skills and the duration of working. Based on the data above, when examining the initial skills of participants before the intervention in relation to their educational background, it was found that among participants with an S1 education background, 3 people (100%) were unskilled in mapping, while among participants with a D3 education background, 6 people (28.57%) were skilled, and 15 people (71.43%) were unskilled. With a p-value of 0.3173, it was found that there is no statistically significant relationship between mapping skills before the intervention and educational background.

- 7) Improvement in the ability of DBD program holders in conducting mapping after the intervention in Bogor City, 2022.

Table 11 Improvement in the Ability of DBD Program Holders in Conducting Mapping after the Intervention in Bogor City, 2022.

		Post Test		Total	P Value
		Unskilled	Skilled		
Pre Test	Unskilled	1	16	17	0,0003 (McNemar Test)
	Skilled	1	6	7	
Total		2	22	24	

From the data above, it can be concluded that the number of participants who were unskilled in conducting manual mapping and unskilled in using the mapping application is 1 person. There were 16 participants who were unskilled in manual mapping but became skilled in using the mapping application. Additionally, there was 1 participant who was skilled in manual mapping but unskilled in using the mapping application, and there were 6 participants who were skilled in both manual mapping and using the mapping application.

With a p-value of 0.0003 (<0.05), it can be concluded that there is a significant difference in the skills of DBD program holders in conducting mapping before and after the intervention. Statistically, it was found that there is a correlation between the level of skills before and after the intervention.

- 8) Improvement in the abilities of DBD program holders in conducting mapping based on participant characteristics.

Table 12 Improvement in the Abilities of DBD Program Holders in Conducting Mapping Based on Participant Characteristics in Bogor City, 2022.

Variable	Skill Upgrade		No Skill Upgrade Occurs	
	n	%	n	%
Gender				
Male	2	9,09	0	0

Female	20	90,91	2	100
Length of work				
<1 Year	18	81,82	1	50
1-10 Years	2	9,09	1	50
>10 Years	2	9,09	0	0
Education				
D3	19	86,36	2	100
S1	3	13,64	0	100

From the data above, it was found that participants whose skills improved based on gender were 2 males (9.09%) and 20 females (90.91%). Based on years of work experience, there were 18 participants (<1 year) (81.82%), 2 participants (1-10 years) (9.09%), and 2 participants (>10 years) (9.09%). In terms of educational background, 19 participants (86.36%) had a D3 degree, and 3 participants (13.64%) had an S1 degree.

On the other hand, participants who did not experience an improvement in skills based on gender were 2 females (100%). Based on years of work experience, there was 1 participant (<1 year) (50%) and 1 participant (1-10 years) (50%). Regarding educational background, 2 participants (100%) had a D3 degree.

9) Improvement in the Skills of DBD Program Holders in Interpreting Data and Identifying High-Risk Areas for DBD in Bogor City, 2022.

Table 13 Improvement in the Skills of DBD Program Holders in Interpreting Data and Identifying High-Risk Areas for DBD in Bogor City, 2022.

		Post Test		Total	P Value
		Unskilled	Skilled		
Pre Test	Unskilled	1	17	18	0,0002 (mcNemar Test)
	Skilled	1	5		
Total		2	22	24	

From the data above, it can be concluded that the number of participants who were not skilled in interpreting data, and were also not skilled in mapping using the application, was 1 person. The participants who were initially not skilled in interpretation became skilled in mapping using the application, totaling 17 people. There was 1 person who was skilled in manual data interpretation but not skilled in interpreting data using the application. Additionally, there were 4 participants who were skilled in data interpretation both before and after the training. With a P-value of 0.0002 (< 0.05), it can be concluded that there is a significant difference in the skills of DBD program holders in data interpretation before and after the intervention. Statistically, it was found that there is a correlation between the level of data interpretation skills before and after the intervention.

c. Test of Data Normality

The test of data normality is used to determine and measure whether the obtained data has a normal distribution or not, and whether the obtained data comes from a population that is normally distributed (Gunawan, 2020).

Table 14 Results of Data Normality Test for the Knowledge of DBD Program Holders at the District Health Center Level in Bogor City, 2022.

Variable	z	Prob > z
Nilai Pretest	-3,78	0,99
Nilai Posttest	0,749	0,06

Test of data normality was conducted using the STATA application with the Shapiro-Wilk test. The results showed that the Pretest data had a Prob > z value of 0.99, and the Posttest data had a Prob > z value of 0.06. Based on these results, it can be concluded that the available data is normally distributed because the Prob > z values are above 0.05.

d. Operational Research Limitations

This study has certain limitations that the researcher was unable to control. The design used in this research was a pre-experimental design with a one-group pretest-posttest design, without a control group and only utilizing the treatment group. This limitation prevents the researcher from ensuring that the observed changes are solely caused by the intervention provided.

Another limitation is the time constraint during the training, which was conducted only for one day. The limited time available for delivering the material and conducting question and answer sessions hinders in-depth discussion.

Additionally, the time limitation for conducting follow-up after the training prevents the researcher from fully assessing the participants' ability to interpret patient data.

Explained

Knowledge is something known related to the learning process (KBBI, 2005). According to Notoatmodjo (2003), knowledge is the result of knowing, which occurs after a person senses a specific object. Knowledge can be acquired naturally or through direct and indirect interventions.

According to Budiman and Riyanto, knowledge can be divided into two types:

1. Implicit knowledge, which is knowledge that is still embedded in a person's experiences and includes intangible factors such as beliefs, personal perspectives, and principles.
2. Explicit knowledge, which is knowledge that has been documented or stored in tangible forms, such as health behaviors.

According to Budiman and Riyanto, factors that influence the level of knowledge are:

1. Education: Education is an effort to develop personality and abilities both within and outside of school (both formal and informal). Knowledge is closely related to education, where individuals with higher education are expected to have broader knowledge. However, having low education does not necessarily mean having low knowledge.
2. Information/Mass media: Mass media is a technique for collecting, preparing, storing, manipulating, announcing, analyzing, and disseminating information for specific purposes (Information Technology Law). Information obtained from both formal and informal education can have short-term effects, resulting in changes or improvements in knowledge.
3. Social, cultural, and economic factors: People's habits and traditions are often performed without reasoning whether they are good or bad. Therefore, a person's knowledge will increase even without active learning. A person's economic status also determines the availability of facilities necessary for certain activities, thus affecting their knowledge.
4. Environment: The environment encompasses everything around an individual, including the physical, biological, and social aspects. The environment influences the process of knowledge acquisition within individuals who are in that environment.
5. Experience: Experience is a way to acquire knowledge by repeating previously acquired knowledge to solve past problems.
6. Age: Age affects a person's cognitive capacity and thinking ability. As age increases, the capacity and patterns of thinking develop, leading to an improvement in acquired knowledge.

Skills are the ability to accomplish tasks (KBBI, 2000). According to Robbins (2000), skills can be divided into four categories:

- 1) Basic literacy skills: Fundamental skills that everyone must possess.
- 2) Technical skills: Skills acquired through learning in a specific technical field.
- 3) Interpersonal skills: Skills related to communication and interaction between individuals.
- 4) Problem-solving skills: Skills in solving problems using logic or intuition.

Since skills are the application of knowledge, the factors that influence skills, according to Notoadmojo (2007), are the same as the factors that influence knowledge levels.

1. Changes in Knowledge of Dengue Fever Program Holders at the Primary Health Center Level

Before intervention, the researcher conducted a correlation test between the initial knowledge of the DBD program holders and their respective characteristics. Statistically, it was stated that there is a correlation between the participants' initial knowledge and their gender, length of service, and educational background.

The correlation test between initial knowledge and gender yielded a p-value of 0.0002 (<0.05), indicating a statistical relationship between initial knowledge and gender. However, based on Budiman and Riyanto, this finding contradicts their statement that gender does not affect a person's knowledge level. The researcher concluded that this statistical relationship was obtained because the sample size was imbalanced between males and females, making the statistical calculation invalid.

Based on the length of service in the DBD field, it was found that there is a relationship between the length of service and the participants' initial knowledge level. This is consistent with the statement by Budiman and Riyanto, which states that work experience can enhance a person's knowledge.

Based on educational background, statistically, there is no relationship between participants' knowledge and their educational background. This contradicts the statement by Budiman and Riyanto, which claims that education influences a person's knowledge level. The researcher suspects that this may be due to an imbalanced sample size between participants with a D3 and S1 educational background.

After the intervention, a p-value of 0.0001 (<0.05) was obtained, indicating a significant difference in knowledge among the DBD program holders before and after the intervention. Statistically, it was found that there is a correlation between the knowledge level before and after the intervention. The improvement in pretest-posttest scores is not related to the participants' characteristics (gender, length of service, and educational background). This supports the statement by Budiman and Riyanto, which states that knowledge improvement is influenced by exposure to information and both formal and informal education.

2. Changes in the Skills of DBD Program Holders in Data Mapping in Bogor City in 2022

Before the intervention, the researcher conducted a correlation test between the participants' initial skills as DBD program holders and their respective characteristics. Statistically, it was found that there is a correlation between the participants' initial skills and their length of service, but there is no correlation between their initial skills and educational background or gender.

The initial skill assessed by the researcher was the skill in manually conducting mapping. Then, the researcher intervened by enhancing the skills through mapping using an application aimed at simplifying and shortening the time required for mapping and intervening in disease control.

After the intervention, a p-value of 0.0001 (<0.05) was obtained, indicating a significant difference in the mapping skills of the DBD program holders before and after the intervention. Statistically, it was found that there is a correlation between the skill level before and after the intervention.

3. Changes in the Skills of DBD Program Holders in Data Mapping in Bogor City in 2022

Before the intervention, the researcher conducted a correlation test between the initial skills of the DBD program holders and their respective characteristics. Statistically, it was found that there is a correlation between the participants' initial skills and their length of service, but there is no correlation between their initial skills and educational background or gender.

Some training participants have already performed data interpretation, but this was not done regularly, and the interpretation results were not used to make decisions in developing disease control strategies.

After the intervention, a p-value of 0.0001 (<0.05) was obtained, indicating a significant difference in the mapping skills of the DBD program holders before and after the intervention. Statistically, it was found that there is a correlation between the skill level before and after the intervention.

5. CONCLUSION

There is a difference in the average knowledge of DBD program holders at health centers after training in terms of DBD surveillance knowledge in Bogor City in 2022 ($p\text{-value} \leq 0.05$). There is a

difference in the improvement of skills in mapping DBD cases among DBD program holders at health centers in Bogor City after training in using the mapping application in 2022 (p-value < 0.05). There is an improvement in skills in interpreting data and determining the stratification of DBD cases among DBD program holders at health centers in Bogor City in 2022 (p-value \leq 0.05).

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