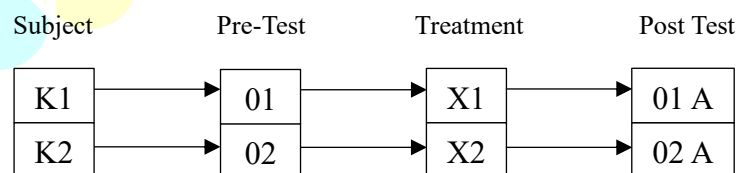


CHAPTER IV RESEARCH METHODS

A. Types of Research and Research Design

This research is a quantitative research using a *quasi-experimental* approach, which is a method that aims to determine the effectiveness of an intervention on certain variables. The design used is a *pre-test* and *post-test* with control group design, where this study aims to determine the effectiveness of *WhatsApp Reminder* smoke-free houses on maternal behavior (knowledge, attitudes and actions) in preventing ISPA in toddlers before and after being given intervention.

The intervention group will be given treatment in the form of education through *WhatsApp Reminder* 3x/week for 2 weeks, which is sent periodically containing educational information about the dangers of exposure to cigarette smoke in the home, the importance of implementing smoke-free homes, and measures to prevent ISPA in toddlers. Meanwhile, the control group did not receive educational messages through *WhatsApp Reminder*, but only received standard educational videos about ISPA through *WhatsApp groups* 1 time.



Bagan 4.1 Research Design

Description :

K1 : Respondents in the intervention group

K2 : Respondents in the control group

01 : Behavioral measurements (knowledge, attitudes, and actions) prior to treatment in the intervention group

- 02 : Behavioral measurements (knowledge, attitudes, and actions) before treatment in the control group
- X1 : Intervention group treatment is given *WhatsApp Reminder* smoke-free house
- X2 : The control group's treatment was given a standard educational video about ISPA through *WhatsApp group*
- 01A : Behavioral measurements (knowledge, attitudes, and actions) after treatment in the intervention group
- 02A : Behavioral measurements (knowledge, attitudes, and actions) after treatment in the control group

B. Research Variables

1. Independent Variables

The independent variable in this study is *WhatsApp Reminder* smoke-free house

2. Dependent Variable

The dependent variables in this study are maternal behaviors consisting of knowledge, attitudes and actions

C. Research Location and Time

1. Research Location

This research was carried out in the Working Area of the Sawah Lebar Health Center, Bengkulu City.

2. Research Time

This research will be conducted from April to July 2026.

D. Population and Sample

1. Populasi

The population in this study is families who have toddlers with ISPA who go to the Sawah Lebar Pusekesmas in Bengkulu City, with an estimate based on the number of ISPA in toddlers in 2025 as many as 217 people.

2. Sample

The sample in this study is part of a family that has a toddler with ISPA and lives at home with a family member of a smoker. Sampling was carried out using *consecutive sampling techniques*. To determine the appropriate respondents in this study, the following inclusion and exclusion criteria were used:

a. Criteria Inclusion:

- 1) Toddler mothers with children aged 12-60 months
- 2) Willing to be a respondent
- 3) Have and be able to actively access *the WhatsApp* application
- 4) Have at least one family member who smokes inside or outside the home

b. Exclusion Criteria:

Families who stated that they were not willing to continue the research intervention.

The calculation of the number of samples in this study is determined based on the formula for difference of 2 mean as follows:

$$n = \frac{2\sigma^2(Z1 - \alpha/2 + Z1 - \beta)^2}{(\mu1 - \mu2)^2}$$

Description :

n : Number of samples

Z1- $\alpha/2$: Standard normal deviation for α (standard deviation $\alpha = 1.96$)

Z1- β : Standard normal deviation for β (standard deviation $\beta = 0.84$)

$\mu1$: The mean value of the control group obtained from the literature.

$\mu2$: Mean value of intervention groups obtained from the literature

$\sigma2$: Estimation of standard deviation from the difference of 2 mean pretest and post test

Based on research conducted by (N. W. E. P. Dewi et al., 2019), yang berjudul “The effectiveness of *WhatsApp* video to increase knowledge of pneumonia early detection among mothers of children under five years”,

It is known that the mean values of the control group ($\mu_1 = 6,518$) and the mean of the intervention group ($\mu_2 = 9,531$). Meanwhile, the standard deviation of the control group ($S_1 = 4,304$) and the standard deviation of the intervention group ($S_2 = 2,666$). The standard deviation differences obtained are used to calculate the average variance and sample size as follows:

a. Searching for σ^2

$$\sigma^2 = \frac{S_1^2 + S_2^2}{2} = \frac{(4.304)^2 + (2.666)^2}{2} = \frac{18.52 + 7.10}{2} = \frac{25.63}{2} = 12.82$$

b. Search n

$$n = \frac{2 \times \sigma^2 \times (Z_{1-\alpha/2} + Z_{1-\beta})^2}{(\mu_2 - \mu_1)^2}$$

$$n = \frac{2 \times 12.82 \times (1.96 + 1.28)^2}{(3.013)^2} = \frac{25.64 \times 10.49}{9.08} = 29.65$$

So the sample per group is 30 respondents

c. Mencari Drop Out

$$n^1 = \frac{n}{1-0.10} = \frac{30}{0.9} = 34 \text{ Orang}$$

So, the final number of samples:

1. Intervention group : 34

2. Control group : 34

Total sample : 68 People

The total sample was 68 people consisting of 34 people from the intervention group and 34 people from the control group.

E. Data Collection

1. Data Source

a. Data Primer

Primary data is data obtained directly from the first source through the process of collecting data in the field. In this study, primary data was obtained directly from the respondents, namely a questionnaire to collect demographic data including the identity of the respondents and the identity of the child, as well as a questionnaire on the knowledge, attitudes, and actions of mothers in implementing smoke-free houses to prevent ISPA in toddlers.

b. Data Seconds

Secondary data in this study was obtained through medical record data and routine reports of the Sawah Lebar Health Center in Bengkulu City, especially regarding the number of ISPA cases in toddlers over the past 1 year.

2. Data Collection Tools

The data collection tools in this study are in the form of:

- a. The respondent's identity form and the characteristics of the mother of the toddler, include: The mother's knowledge of the smoke-free house, the mother's attitude about the RBAR, the mother's actions in implementing the RBAR, as well as the informed consent sheet, the application sheet and the respondent's consent.
- b. Questionnaire of knowledge, attitudes and actions of mothers towards the RBAR program. This questionnaire contains statements related to the level of knowledge of mothers about the concept and goals of RBAR, mothers' attitudes towards the implementation of RBAR, and mothers' real actions in implementing and maintaining RBAR in the home environment.

3. Test Data Collection Tools

To measure the level of knowledge of mothers related to the implementation of smoke-free houses (RBAR), mothers' attitudes about RBAR and mothers' actions in implementing RBAR, the researcher used

questionnaire instruments developed based on RBAR guidelines from *Quit Tobacco Indonesia* (QTI) and combined with similar instruments in previous studies. This instrument consists of a number of statements prepared to assess the extent of respondents' understanding, attitudes, and actions in supporting and implementing the smoke-free home program in the home environment.

Before being used in the research, the questionnaire of knowledge, attitudes and actions has gone through a validity test and reliability test to ensure that the instrument is really able to measure the variables set. The validity test aims to see the extent to which each question item in the questionnaire is able to measure the aspect of knowledge that should be measured. The validity test was carried out using the Pearson Product Moment correlation technique. An item is declared valid if *the value of r is calculated $> r$ of the table* at a significance level of 5% ($p < 0.05$). The results of the calculation showed that all statements on the questionnaire had a calculated r -value of > 0.361 , so that all items were declared valid and suitable for use in the research.

Meanwhile, reliability tests aim to measure the internal consistency of the instrument, which is the extent to which the instrument provides stable results if used repeatedly. The test was carried out using Cronbach's Alpha formula. An instrument is declared reliable if Cronbach's Alpha value ≥ 0.60 . The results of the reliability test showed that the knowledge questionnaire had a Cronbach's Alpha value of 0.812, an attitude questionnaire with a value of 0.833, and an action questionnaire with a value of 0.854 which means that the level of reliability is high. Thus, the instruments of knowledge, attitudes and actions in this study are declared reliable and can be used as a measuring tool in research.

4. Data Collection Procedure

The data collection procedure is carried out through several stages, which are as follows:

a. Pre-Research

Compiling data instruments, from collection of characteristic data, observation sheets, making ethical protocols and ethical feasibility tests, testing the feasibility of the instruments used.

b. Research Process

- 1) The researcher identified and selected respondents based on the inclusion and exclusion criteria that had been set, namely mothers of toddlers with ISPA in the working area of the Sawah Lebar Health Center, Bengkulu City. The list of prospective respondents was obtained through data on Puskesmas visits/children's poly register books.
- 2) The researcher explained the purpose of the research, implementation procedures, benefits, and confidentiality rights of respondents' data. At this stage, the procedure for filling out the questionnaire (*informed consent*) is also explained.
- 3) After the respondent understood the information provided and agreed to it, the researcher asked the respondent to sign an agreement sheet to become a research participant.

4) Pre-test Data Collection

The initial data collection was carried out by filling out a questionnaire by respondents directly through the google form.

5) Providing Intervention (WhatsApp *Reminder Education*)

The intervention was carried out through sending *WhatsApp Reminder educational messages* to respondents periodically, namely 3x/week during the 2-week intervention period. The provision of this intervention is described as follows:

- a) In the first week, education is focused on building a basic understanding of the dangers of secondhand smoke for toddlers and the importance of smoke-free homes (RBAR). On the first message,

respondents received *a reminder* about the dangers of cigarette smoke to the health of toddlers. In the second message, it was continued with material about passive smoking and *third hand smoke*. Furthermore, in the third message, respondents were introduced to the concept of RBAR and the reason for the importance of implementing a smoke-free home environment.

- b) In the second week, education is directed to hands-on practice and prevention efforts. In sending the message, the four respondents were given practical steps to realize RBAR. In the fifth message, the material contains strategies to reduce exposure to cigarette smoke in toddlers. Finally, in sending a message, *Reminders* are given to strengthen efforts to prevent ISPA and invite families to maintain healthy behavior at home.
- 6) After the provision of WhatsApp Reminder *educational interventions*, the researcher will check whether the respondents have received and read (tick 2 blue) the *Reminder* messages that have been given or not. If the *Reminder* message has not been read by the respondent, the researcher will confirm by giving a message/calling the respondent.
- 7) Final Data Collection (Post-test)
Post-test data collection was carried out after 2 weeks of intervention to measure changes in the mother's level of knowledge, attitudes and actions with the same questionnaire.
- 8) The researcher processes the data according to the required data.

F. Data Processing

The data that has been collected is processed using a computer, with the following stages:

1. *Editing*

The results of the questionnaire sheets are edited first by checking and re-checking the data that has been collected to ensure completeness, suitability, and clarity of the data.

2. *Coding dan Sorting*

At the coding stage, *numerical coding* is carried out on data that has several categories to make it easier for researchers to analyze data and speed up the data entry process. And the data is grouped according to their respective codes.

3. *Entry Data*

The stage of entering data into the computer corresponds to the existing variables. Furthermore, the data obtained will be analyzed according to the type and use of the data.

4. *Processing*

The finished data is then statistically tested using computerization.

5. *Cleaning*

Double-check the data that has been entered into a computerized device to see if there is missing data by making a list, and the data that has been *entered* is correct or incorrect by looking at the variation of data or code used.

G. Data Analysis

1. Univariate Analysis

Univariate analysis was conducted to describe the characteristics of respondents and research variables in a descriptive manner. Categorical characteristics of respondents such as education, occupation, history of ISPA in toddlers were analyzed using frequency distribution and percentage

Meanwhile, numerical data such as maternal age, number of children and *pre-test and post-test scores* of knowledge, attitudes, and actions were

analyzed using descriptive statistics including mean, median, standard deviation, minimum-maximum value, and 95% Confidence Interval (CI). The results of the univariate analysis are presented in the form of a table and described narratively to provide an overview of respondent characteristics and the distribution of research variables.

2. Bivariate Analysis

A bivariate analysis was conducted to test the effectiveness of *the intervention of WhatsApp Reminder* smoke-free houses on changes in knowledge, attitudes and actions of mothers in the prevention of ISPA in toddlers. Before the hypothesis test was carried out, the data normality test was first carried out using the Shapiro-Wilk test.

If the data is distributed normally, then:

- a. To compare the scores of knowledge, attitudes and actions pre and post in the same group, a *paired t-test* was used.
- b. To find out the difference in scores between the intervention and control groups, an independent T-test was used.

If the data is not normally distributed, then:

- a. For paired data (pre-post in the same group) the *Wilcoxon Signed Rank Test* is used.
- b. To compare the two groups (intervention and control) the *Mann-Whitney U Test* was used.

All statistical tests were conducted with a 95% confidence level ($\alpha = 0.05$).

H. Research Flow

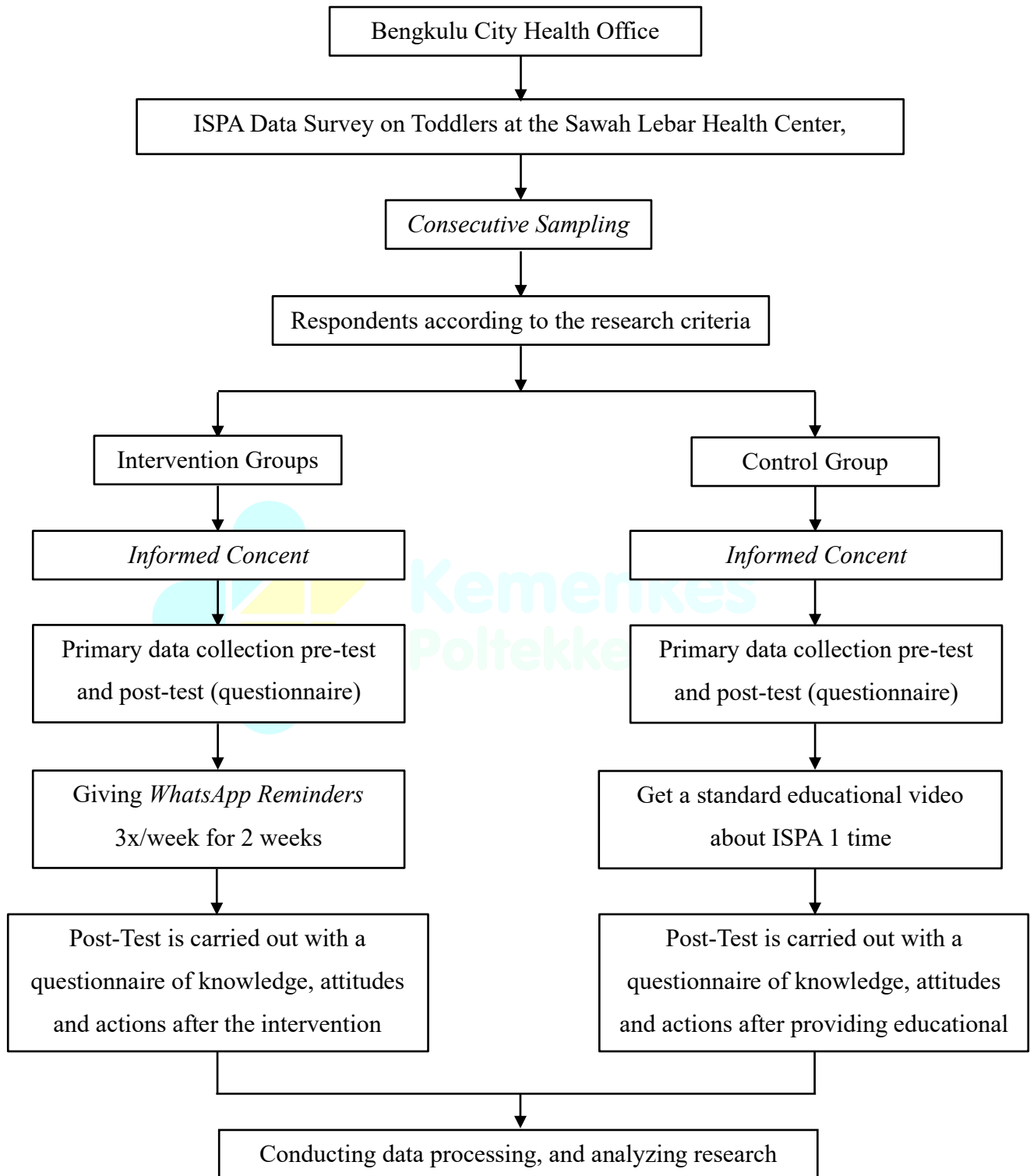


Chart 4.2 Research Flow

I. Research Ethics

1. Informed Consent

The purpose of informing respondents about the purpose and purpose of the research during data collection. If the respondent is willing to be examined, he must be willing to sign the consent sheet provided by the researcher. If the respondent refuses to be researched, the researcher will not force and respect and respect the respondent's decision or rights.

2. *Self-Determinan*

Respondents have the right to choose to participate in this study or refuse without any coercion.

3. *Beneficence Principle*

The principle of usefulness guarantees that this research is beneficial for both parties.

4. *Nonmaleficence*

The principle of no harm guarantees that the study does not cause discomfort, harm, or harm to the respondent either physically or psychologically.

5. Anonymity

Maintaining the confidentiality of the respondent's identity, the researcher did not include the respondent's name on the consent sheet and questionnaire, but only included the initials.

6. *Keadilan (Justice)*

The researcher treated each respondent fairly where each respondent was intervened every 3x/week for 2 weeks.

