# CHAPTER IV
# RESEARCH METHODS

## A. Types of Research and Research Design

This research design applies a quantitative methodology with a quasi-experimental framework, specifically utilizing a pre-test and post-test design with a control group. The research subjects will be grouped separately into two treatment categories: the intervention group (a combination of RT and CPT) and the control group (brain gym). The neurocognitive capacity of all respondents will be measured in the initial phase (pre-test) and the terminal phase (post-test). The effect of the combined intervention will then be evaluated comparatively with the results recorded in the control group through inferential analysis to determine any significant effects.

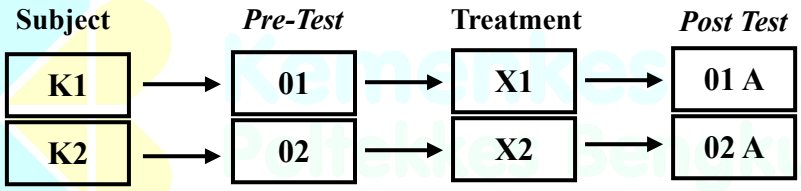


**Chart 4.1Research Design**

**Information :**

| | | |
|---|---|---|
| K1 | : | Respondents in the Intervention Group |
| K2 | : | Respondents in the Control Group |
| 01 | : | Measurement of Cognitive Function Before Being Given the Intervention Group (Combination of RT and CPT) |
| 02 | : | Measurement of Cognitive Function Before Intervention in the Control Group (Brain Gym) |
| X1 | : | Intervention Group Treatment (Combination of RT and CPT) |
| X2 | : | Control Group Treatment (Brain Gym) |
| 01A | : | Measurement of Cognitive Function After Intervention in the Intervention Group (Combination of RT and CPT) |
| 02A | : | Measurement of Cognitive Function After Intervention in the Control Group (Brain Gym) |

## B. Research Variables

This study identified independent and dependent variables. The independent variable to be tested was the combination of RT and CPT, which constituted the treatment intervention. Meanwhile, the primary dependent variable was improved cognitive function in the elderly, which was the outcome of the treatment. In addition to these two variables, there were confounding variables, such as age, gender, and education level.

## C. Location and Time of Research

1. Research Location

   This research will be conducted at the Pagar Dewa Social Home for the Elderly (PSTW) on Jl. H. Adam Malik No. 9, Gading Cempaka District, Bengkulu City, Bengkulu Province 38225.

2. Research Time

   The research implementation and data collection period is planned to be carried out from April to June 2026.



## D. Population and Sample

1. Population

   The total target population recorded at the PSTW in Bengkulu City for the 2025/2026 research period was 62 people, consisting of 39 men and 23 women, based on the official administrative records of the Tresna Werdha Social Home in Bengkulu City in 2026.

2. Sample

   The sample in this study was a subset of the elderly population at the Bengkulu City PSTW who met the inclusion and exclusion criteria established by the researcher. The sampling technique used was non-probability sampling with a purposive sampling approach. Purposive sampling is a sampling technique based on specific considerations established by the researcher in accordance with the research's inclusion and exclusion

criteria. Through this technique, the selected respondents are deemed capable of providing information that aligns with the research objectives.

**a. Calculating Samples**

The calculation of the minimum sample size in this study was determined using the following formula for the difference between two means:

$$n = \frac{\sigma^2(Z1-\alpha\ + Z1-\ \beta)^2}{(\mu 1-\mu 2)^2}$$

**Information :**

| | | |
|---|---|---|
| n | : | Number of Samples |
| $Z1-\alpha$ | : | Normal Standard Deviation For A (Standard Deviation A = 1.96). |
| $Z1-\beta$ | : | Normal Standard Deviation For B (Standard Deviation B = 0.84) |
| μ1 | : | Mean Values in the Intervention Group Obtained from the Literature |
| μ2 | : | Mean Values in the Control Group Obtained from the Literature |
| $\sigma^2$ | : | Estimation of Post-Test Standard Deviation Based on Literature |

Based on researchMartina et al. (2024)on "The Effect of Reminiscence Therapy on Cognitive Levels in the Elderly at the Taman Bodhi Asri Elderly Home" in 38 elderly respondents who were given reminiscence therapy, the mean value before the intervention was (μ1 = 23.52), the mean value after the intervention (μ2 = 14.55), with a standard deviation value (σ = 3.095 in the pretest and σ = 3.437 in the posttest).

The results of the paired sample t-test showed a p value = 0.000, which means there was a significant difference between cognitive levels before and after reminiscence therapy.

$$n = \frac{(13{,}96)^2 \,.\, (1{,}96 + 0{,}84)^2}{(23.52 - 14.55)^2}$$

$$n = \frac{194{,}99 \,.\, (2.80)^2}{(8{,}97)^2}$$

$$n = \frac{194{,}99 \,.\, 7{,}84}{80{,}5409}$$

$$n = \frac{1529{,}00}{80{,}5409}$$

$$n = 18{,}99$$

$$n = 19$$

Drop Out:

$$n' = \frac{n}{(1 - f)}$$

$$n' = \frac{19}{(1 - 0{,}1)}$$

$$n' = \frac{19}{(1 - 0{,}1)}$$

$$n' = \frac{19}{(0{,}9)}$$

$n' = 21$person

So the total sample is:

$n =$ Intervention Group + Control Group

$n = 21\ orang + 21$person

$n = 42\ orang$

Based on the sample calculation results, the minimum sample size required is 21 individuals. Each intervention and control group will involve 21 respondents, resulting in a total sample size of 42 respondents.

**b. Sample Criteria**

Sampling was based on the inclusion criteria and exclusion criteria that had been established:

1) Inclusion Criteria
   a) Elderly people aged ≥ 60 years who are registered as active residents of the Bengkulu City PSTW.
   b) Elderly people who are willing to be respondents and sign the Informed Consent.

c) Elderly people who have cognitive function in the established category Elderly people who have cognitive function in the mild category with an MMSE score of 18 – 23.

d) The elderly are in a cooperative condition and are able to communicate.

e) Elderly people who are willing to participate in the entire series of intervention sessions.

2) Exclusion Criteria

a) Elderly people who refuse to continue participating in the research process.

b) Elderly people who were absent more than once (or the researcher's tolerance limit) in the intervention session.

c) Elderly people died during the study period.

d) Older adults were transferred to another care unit (e.g., transferred to an intensive care unit or different facility) or left the PSTW permanently during the intervention period.



## E. Data collection

### 1. Primary Data

The primary data in this study were obtained directly by the researcher from respondents through interviews and measurements using research instruments. The primary data collection procedure for the study, "The Effect of a Combination of Reminiscence Therapy and Crossword Puzzle Therapy on Improving Cognitive Function in the Elderly at the Tresna Werdha Social Home in Bengkulu City in 2026," is as follows:

a. Data Collection from Respondents, namely data obtained directly from the elderly who live and participate in PSTW activities in Bengkulu City as the research location.

b. Research Explanation and Respondent Consent: The researcher provides an explanation to potential respondents regarding the research objectives, benefits, implementation procedures, and rights and obligations as research participants. After the explanation is provided, the researcher

requests the potential respondents' consent to participate in the research. If the potential respondent refuses, the process is terminated without coercion. If the potential respondent agrees, the researcher asks them to sign an informed consent form.

c. Characteristic Data Collection: Researchers collect respondent characteristic data in the form of name or initials, age, gender, and education level. Data collection is conducted through direct interviews and recording on a prepared observation sheet.
d. Explanation of the Purpose and Procedures of the Intervention: The researcher explains to respondents the purpose of the research, the benefits to the respondents and the institution, the intervention procedures, and the estimated timeframe. The explanation is provided politely and in a manner that is easy to understand so that respondents can participate comfortably in the intervention activities.
e. Cognitive Function Measurement: Researchers conducted initial cognitive function measurements using the MMSE questionnaire with a score range of 18–23. The MMSE scores were used to determine respondent eligibility according to the inclusion criteria established by the researchers. If potential respondents met the inclusion and exclusion criteria, they were designated as research samples.

**2. Secondary Data**

The secondary data in this study is data obtained by the researcher from previously available sources. The secondary data used in this study was the number of elderly people registered at the Bengkulu City PSTW. This data was used by the researcher to determine the study population size and as a basis for determining the sample of elderly people who would participate in the intervention.

### 3. Data Collection Procedures

The method of collecting data in this study is as follows:

a. Respondent characteristics data were collected through interviews and filling out observation sheets that included demographic information such as age, gender, and education level.
b. Intervention implementation data was recorded to ensure treatment compliance. This data was collected through observation sheets as researchers performed actions according to the combined RT and CPT procedure/SOP sheets.
c. Cognitive function data (dependent variable) were collected through structured interviews and observation sheets using the MMSE questionnaire. The MMSE score range used as inclusion criteria and measurement data was 18–23.

## F. Research Instruments

*Mini Mental State Examination*The Multi-Method Self-Questioning (MMSE) is a cognitive screening instrument used to assess basic mental function in the elderly and detect cognitive impairment. The MMSE assesses five main domains: orientation to time and place (0–10), registration or the ability to record information (0–3), attention and calculation (0–5), recall or short-term memory (0–3), and language and visuospatial abilities (0–9). The total MMSE score ranges from 0–30, with interpretations as follows: 24–30 indicates normal cognitive function, 18–23 indicates mild cognitive impairment, and 0–17 indicates severe cognitive impairment. In this study, the MMSE was used as the primary instrument to measure the cognitive function of the elderly before and after being given a combination of RT and CPT intervention, because this instrument has proven to be reliable, easy to use, and able to provide a comprehensive picture of the elderly's cognitive status quickly and accurately.(Manungkalit et al., 2021).

## G. Data processing

According toWidodo et al. (2023), the data obtained from the data collection process will be processed using computer software through several stages as follows:

1. Editing: After all questionnaires and observation sheets were collected, the researcher checked the data for completeness and consistency. This check was conducted to ensure that all items on the MMSE questionnaire had been completed correctly, that no sections were missing, and that the data complied with the data entry procedures. If any discrepancies were found, the researcher immediately made corrections and ensured the data was complete before proceeding to the next stage.
2. Coding After the editing process is complete, the data is coded with the aim of differentiating between the pre-intervention group and the post-intervention group.
3. Sorting

   The data is then grouped according to the codes that have been given, so that pre-intervention and post-intervention data can be separated.
4. Entry

   The numeric data was then entered into a computer using a statistical data processing program. Researchers entered each variable in a predetermined order and format, including respondent identity, demographic characteristics, and pre-test and post-test MMSE scores.
5. Processing

   After data entry is complete, the researcher processes the data for statistical analysis. This stage includes data grouping, frequency distribution calculations, normality tests, and paired sample t-tests (Wilcoxon) based on the characteristics of the MMSE data obtained. The entire process is performed using computer statistical software.
6. Cleaning

   This is the final step in double-checking the data that has been entered. Researchers check for missing data, coding errors, or inconsistencies.

This check involves examining data variations, score ranges, and re-verifying with the original questionnaire. Incorrect data is immediately corrected to ensure the dataset used for analysis is completely clean and valid.

## H. Data analysis

Data analysis was carried out to process and interpret the results of Cognitive Function measurements before (pre-test) and after (post-test) the administration of the RT and CPT Combination, through univariate and bivariate analysis stages to determine the effect of the intervention on improving cognitive function in the elderly.

1. Univariate Analysis

   Univariate analysis is used to provide a description or overview of the characteristics of respondents and each research variable. This analysis is conducted to display the distribution of data from the independent and dependent variables.

   a. Numerical data: for numerical variables such as age and cognitive function scores (based on MMSE), descriptive analysis was performed including mean, standard deviation (SD), median, minimum and maximum values (min–max), and 95% confidence interval (CI).
   b. Categorical data: meanwhile, categorical data such as gender and education level are analyzed using frequency distribution and percentage to describe the characteristics of respondents proportionally.

2. Bivariate Analysis

   Data analysisThe bivariate analysis in this study began with a test of the equality of the two data groups and a test of data normality. Bivariate analysis aims to identify differences between two variables. Before conducting the analysis, the researcher conducted a data normality test using the Shapiro-Wilk method, considering the number

of respondents <50 respondents. If the data showed normal distribution, the difference in average cognitive function scores before and after the intervention in the intervention and control groups was evaluated using a paired sample t-test. Conversely, if the data were not normally distributed, the Wilcoxon test was applied.

After that, to determine whether there is a significant difference in the average between the intervention group and the control group, a test was used.independent t-test if the data is normally distributed. However, if the results of the normality test indicate that the data is not normal, the analysis is carried out using the Mann-Whitney test. If $p < \alpha$ 0.05 then there is a significant difference, which means there is an influence, so the alternative hypothesis (Ha) is accepted. Conversely, if the p value > α 0.05 there is no significant difference, which indicates no influence, so the alternative hypothesis (Ha) is not accepted.

## I. Research Flow

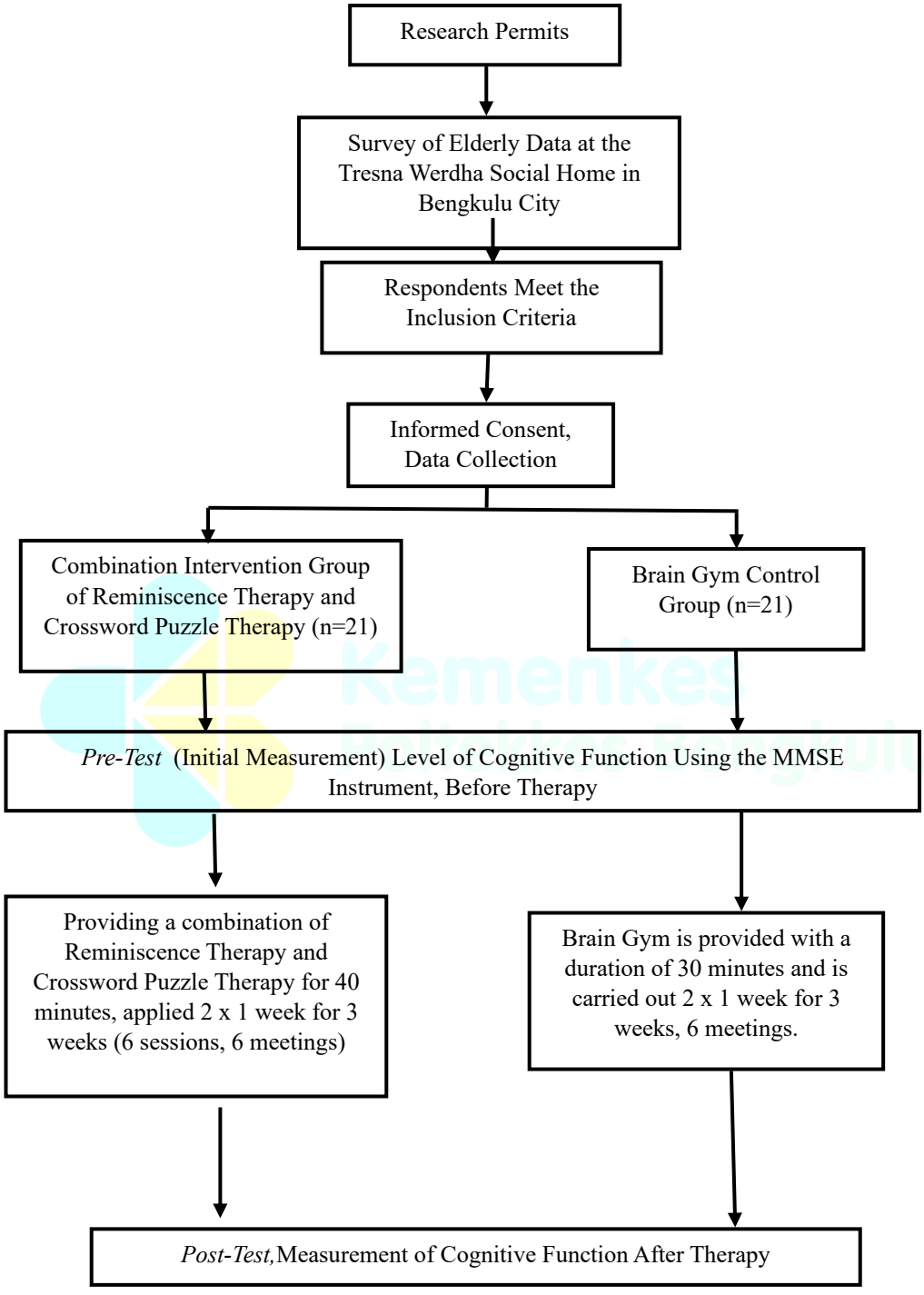


**Chart 4.2Research Flow**

## J. Research Ethics

This study addresses ethical and legal aspects of the study to protect respondents from all forms of harm and discomfort, both physical and psychological. This study has undergone an ethical review process and has been deemed ethically sound, adhering to the following ethical principles:

1. *Self-Determination*(Right to Determine Your Own Fate)

   In this study, each client was given complete freedom to choose whether or not to participate. There was no coercion from the researcher or the institution where the research was conducted. Respondents also had the right to withdraw at any time without any consequences.

2. Anonymity

   Researchers ensured respondents' anonymity by not including their full names on the research instruments. Respondents' identities were replaced with codes or initials. However, for administrative purposes, such as completing informed consent forms, signatures were included and known only to the researchers.

3. Confidentiality

   All respondent data will be kept confidential and used solely for research purposes. Data will be stored as a password-protected soft file on the researcher's computer. No personal information will be disseminated or used by any third party beyond the research purpose.

4. Justice

   Throughout the research process, all respondents were treated fairly without distinction of social status, gender, age, or severity of mental illness. The principle of fairness was applied by upholding honesty, openness, and professionalism throughout the data collection and therapy process.

5. The Principle of Beneficence

   This research is expected to benefit clients with mental disorders by improving self-esteem through the application of Gestalt therapy and interpersonal therapy. Furthermore, respondents will gain firsthand

experience with psychotherapy techniques that can help improve self-awareness and social interaction skills.

6. Non-Maleficence

   Researchers ensure that all therapy activities are conducted with the safety and comfort of the participants in mind. Researchers will discontinue therapy if they detect signs of discomfort, severe emotional resistance, or worsening medical/psychological conditions during the therapy process.

## K. Activity Flow

Stages of research activities that have been planned:

1. Researchers provide written consent forms to prospective participants and obtain their approval before starting the research, as a form of respect for participants' rights and a guarantee that participation is carried out voluntarily with in-depth understanding.
2. Researchers explain to prospective participants the aims, benefits, and procedures of the research to be carried out, so that participants fully understand the research process and their role in the study.
3. After obtaining consent, the researcher recorded initial data on an observation sheet, which included participant characteristics and muscle strength measurement results, to ensure data accuracy and completeness.
4. The first participants successfully recruited will be assigned to the intervention group.
5. The steps from points 1 to 4 are repeated repeatedly until the number of participants in the intervention group is reached.
6. Similar procedures (points 1 to 4) were then applied to the control group until the sample size was reached. Next, the researcher provided education about the research procedures to participants in the control group before the intervention was administered.