

CHAPTER IV

RESEARCH METHODS

A. Research Type and Design

This type of research is a quantitative research with an experimental analytical design, this type of research aims to determine the influence of a treatment on other variables. The design used is *quasi-experimental with a one group pretest-posttest design* approach, where there is one group that will be intervened before (*pretest*) and after (*posttest*). This design aims to determine the effect of *Yoga for Cancer Survivors* (YOCAS) and *Mentha piperita L.* Aromatherapy on sleep disorders in cancer patients undergoing chemotherapy, the research design in this study is:

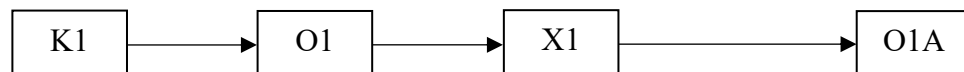


Chart 4. 1 Research Design

Description:

- K1 = Respondents (YOCAS therapy and Aromatherapy *Mentha piperita L.*
- O1 = *Pre-test* (initial measurements using PSQI before intervention YOCAS and Aromatherapy *Mentha piperita L.* given)
- X1 = Administered YOCAS Therapy) and Aromatherapy *Mentha piperita L.*
- O1A = *Post-test test* (final measurement using PSQI after were given the intervention of YOCAS and Aromatherapy *Mentha piperita L.*Düssel

B. Research Variables

The independent variables in this study were *Yoga for Cancer Survivors* (YOCAS) therapy and *Mentha piperita L* Aromatherapy, while the dependent

variable was sleep quality disorders measured using the *Pittsburgh Sleep Quality Index* (PSQI) Questionnaire.

C. Research Location and Time

1. Research Location

This research was conducted in the Chemotherapy Room of dr. M. Yunus Bengkulu Hospital, Jalan Bhayangkara No.28, Sidomulyo Village, Gading Cempaka District, Bengkulu City, Bengkulu Province.

2. Research Time

Preparation: February 2026

Implementation of intervention and data collection: March 09 to June 09, 2026

Analysis and preparation of the report: June 2026

D. Population and Sample

1. Population

All cancer patients undergoing chemotherapy at the Chemotherapy Room of dr. M. Yunus Hospital, Bengkulu City, with a population in 2025 from January to July of 327 people.

2. Sample

In this study, the sample consisted of patients undergoing chemotherapy. Sampling is carried out by means of *Consecutive Sampling* by considering inclusion and exclusion criteria, such as:

a. Inclusion criteria

- 1) Patients with a diagnosis of Stage I-III Cancer
- 2) An outpatient cancer patient who is undergoing chemotherapy in the Chemotherapy room of dr. M Yunus Bengkulu Hospital.
- 3) Chemotherapy patients who live in Bengkulu City.
- 4) Respondents' willingness to participate in the study
- 5) Willing to be a respondent and sign *informed consent*.
- 6) Have a sleep disorder characterized by a Pittsburgh Sleep Quality Index (PSQI) score of >5 .

- 7) Patients can sit for long periods of time.
 - 8) The general condition of the patient is stable.
- b. Exclusion criteria
- 1) Patients Experiencing unstable clinical conditions, such as:
 - a) Nausea and vomiting
 - b) Dizziness
 - c) Motion System Disorders
 - d) Uncontrolled Severe Pain
 - e) Decreased Consciousness
 - 2) Patients taking sleeping pills
 - 3) Patients with severe complications or terminal conditions.
 - 4) Allergy or hypersensitivity to the aromatherapy used.
 - 5) Uncooperative or resigned during the intervention period.

The sample calculation uses a different formula for one pair mean, namely:

$$n = \left(\frac{Z \times S}{E \times X_D} \right)^2$$

Description:

n = number of samples Z = Z value at 95% confidence level (1.64)

S = Standard deviation in previous studies

E = Desired relative determination (7%) XD = Mean of previous research

The research conducted by Pai et al (2020) on *Quality of Sleep in Patients with Cancer: A Cross-sectional Observantional Study* on sleep quality in cancer patients measured using *the Pittsburgh Sleep Quality Index* (PSQI), obtained a standard deviation value of S = 3.52 and an average PSQI score XD = 6.57, the sample calculation was obtained as follows:

$$n = \left(\frac{Z \times S}{E \times X_D} \right)^2$$

$$n = \left(\frac{1,64 \times 3,52}{0,093 \times 6,57} \right)^2$$

$$n = \left(\frac{5,77}{0,61} \right)^2$$

$$n = (9,45)^2$$

$$n = 89.26 \text{ (rounded } n = 90)$$

The calculation of the size of the sample, the number of research samples obtained was 90 respondents.

E. Data Collection

1. Data Source

a. Primary Data

Primary data is data obtained directly by researchers from respondents. The research collected data through a direct interview process, observation and filling out a data form to the respondents. Primary data include name, age, number of chemotherapy cycles, gender, stage of cancer, comorbidity and sleep disorders

b. Secondary Data

Secondary data is data obtained by researchers from sources that have been available from medical record data of Dr. M. Yunus Bengkulu Hospital.

2. Data Collection Tools

- a. *Pittsburgh Sleep Quality Index* (PSQI) questionnaire to measure a patient's sleep quality (19 items, 7 components).
- b. SOP for YOCAS Intervention and *Mentha piperita L. Aromatherapy Delivery* as guidelines for the implementation of therapy.
- c. Observation sheets to record the implementation of interventions.

3. Test Data Collection Tools

The measurement instrument used in this study is *the Pittsburgh Sleep Quality Index* (PSQI), which functions to assess the sleep quality of respondents. This instrument was developed by Buysse et al. at the *University of Pittsburgh*, and to date has become one of the most widely

used measuring instruments in research related to sleep disorders.

a. Validity Test

PSQI has been shown to have high criterion validity, as described in a study by Carpi et al. (2025) entitled *The Pittsburgh Sleep Quality Index: A Brief Review*. The study involved 148 participants (52 healthy people, 34 patients with major depressive disorder, and 62 patients with sleep disorders). The results showed that the global PSQI score was able to significantly differentiate between individuals with sleep disorders and individuals with normal sleep quality.

A *cut-off* value of 5 on PSQI can identify up to 89% of patients, with a sensitivity of 90% and a specificity of 87%, proving that this instrument has excellent discriminative ability in assessing sleep disorders.

b. Reliability Test

In the same study, PSQI showed high internal consistency with *Cronbach's Alpha* coefficient of 0.83, as well as time stability (test-retest) with a value of $r = 0.85$. These results indicate that PSQI provides consistent and reliable results when used to measure sleep quality in a variety of conditions and populations.

The systematic review and meta-analysis cited by Carpi et al. (2025) also reinforce these findings by stating that despite variations in some components (such as sleep medication use and daytime dysfunction), the overall PSQI score still has high reliability and strong convergent validity on various sleep quality indicators.

4. Data Collection Procedure

a. Preparation Internship

Taking care of research permits, socializing activities to respondents, and preparing tools and materials.

b. Pretest Internship

Respondents filled out the PSQI questionnaire before being given the intervention.

c. Internship Intervention

1. Yoga for Cancer Survivors (YOCAS) *therapy* is carried out for 30 minutes/session, 2 times a week, for 4 weeks.
2. *Aromatherapy Mentha piperita L.* administered by inhalation for 30 minutes in conjunction with *Yoga Therapy for Cancer Survivors*, with 10 drops of *peppermint essential oil* and 100ml of water.

d. Post-test Internship

After 4 weeks of intervention, respondents again filled out the PSQI questionnaire.

F. Data Processing

The data processing steps in this study include the following stages:

1. *Editing*

This stage is carried out to check the completeness and consistency of data obtained from questionnaires and observation sheets. The researcher ensures that there is no blank, duplicate, or incorrect data, and makes corrections if there are writing errors or inconsistencies in respondents' answers.

2. *Coding*

At this stage, each research variable is given a numerical code to facilitate the process of data input and analysis using the SPSS program. The PSQI score is recorded according to the total score obtained by the respondents in the pre-test and post-test without changing the unit of measurement.

3. *Entry and Saving*

All encoded data is entered into the IBM SPSS Statistics program version ≥ 25 . The steps include:

- a. Create worksheets (*data view* and *variable view*).
- b. Fill in the variable names, labels, *values*, and scales according to the *coding* table above.
- c. Re-check after *entry*. The data that has been inputted is then stored in two forms of backup (*flash drive* and external *hard drive*) to maintain data

security and integrity.

4. Tabulating

The data that has been entered is then compiled in the form of a frequency and distribution table using SPSS. Descriptive analysis was used to see the distribution of respondent characteristics. Bivariate analysis (two-mean difference test or alternative test according to data type) was used to determine the effect of YOCAS therapy and aromatherapy on the quality of patient sleep.

G. Data Analysis

Data analysis is the process of processing and interpreting data obtained from research results to answer research objectives and test hypotheses. The data that has been collected will be processed using the IBM SPSS Statistics program version ≥ 25 . The analysis process is carried out through the following stages:

1. Univariate Analysis

The analysis of univariate data aims to provide an overview of the characteristics of respondents and sleep disorder scores in this study. The numerical data used included the age of the respondents and the PSQI sleep quality score before (pre-test) and after the intervention (post-test). The data will be calculated with several descriptive statistics, such as mean value, median, miStudent IDum-maximum value, and standard deviation. Meanwhile, category data such as gender and length of chemotherapy were analyzed using frequency and percentage distributions. The results of univariate analysis were presented in the form of a table and interpreted to describe the respondent profile and the distribution of sleep disorder scores at each measurement time.

2. Bivariate Analysis

Bivariate analysis was used to determine the difference or effect of interventions (YOCAS therapy and *Mentha piperita L.* aromatherapy) on sleep disorders measured using PSQI.

The statistical test used was adjusted to the type of data and the normality distribution of the *results of the Kolmogorov-Smirnov* test. In a group (pretest–posttest), the test used is paired t-test if the data is normally distributed and if the data is abnormal, the *Wilcoxon Signed Rank Test* is used. The purpose was to find out the change in PSQI score before and after the intervention. The decision-making criterion is that if the p value < 0.05 , then H_0 is rejected and H_1 is accepted, meaning that there is a significant influence of YOCAS therapy and aromatherapy *Mentha piperita L.* on sleep disorders, and if the p value ≥ 0.05 , then H_0 is accepted, meaning there is no significant influence.



H. Research Flow

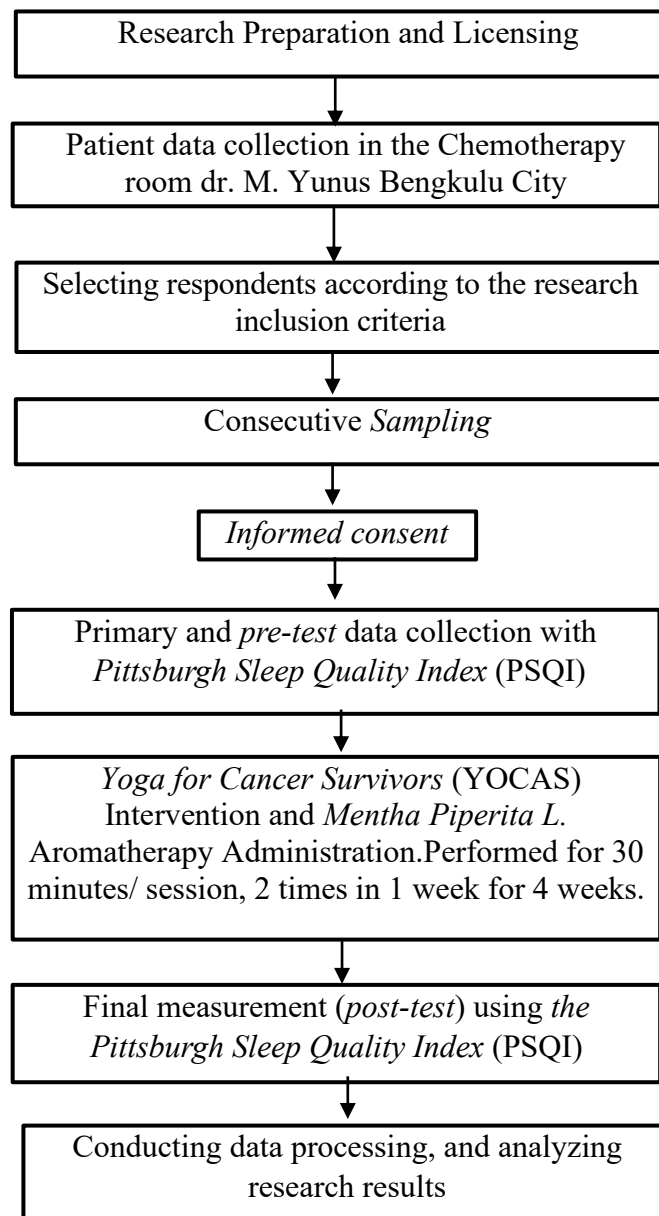


Chart 4. 2 Research Flow

I. Research Ethics

This research was carried out by paying attention to the ethical principles of health research. The purpose of applying research ethics is to protect the rights, safety, and welfare of respondents and ensure that research is conducted morally and professionally.

The principles of research ethics applied are as follows (Haryani & Idi Setiyobroto, 2022):

1. *Informed Consent*

Prior to the conduct of the study, respondents were given a full explanation of the objectives, benefits, research procedures, potential risks, and the right to refuse or discontinue participation at any time without negative consequences. Explanations are delivered orally and in writing in a language that is easy for the respondents to understand.

Respondents who agreed to participate were asked to sign an *informed consent sheet* as proof of willingness to participate in the study voluntarily.

2. *Anonymity*

In the entire research process, the respondents' names and personal identities were not included on the questionnaire sheets or the results of the analysis. Each respondent is assigned a specific code (e.g. R1, R2, R3, and so on) to maintain anonymity. As such, no individual data can be traced back to a specific respondent.

3. *Confidentiality*

All respondents' personal information is kept confidential and is only used for the purposes of this research. Data is stored securely in the form of password-protected files and will not be published individually. Only researchers and supervisors have access to the original data.

4. *Beneficence* (Benefits and Non-Harms)

This research was carried out on the principle of providing benefits and not causing losses to respondents. The interventions carried out, namely Yoga for Cancer Survivors (YOCAS) therapy and

Mentha piperita L. aromatherapy, are non-invasive, safe, and have been scientifically proven to provide a relaxing effect and improve sleep quality. It is hoped that the results of this study can make a real contribution to improving the quality of nursing services and the welfare of cancer patients undergoing chemotherapy.

5. *Ethical Clearance*

Before the research was carried out, the researcher submitted an ethical clearance to the Health Research Ethics Committee of Dr. M. Yunus Hospital Bengkulu City. This procedure aims to obtain official approval that the research has met ethical standards and does not pose a risk of harm to respondents.



