CHAPTER IV
RESEARCH METHODS

A. Types of Research and Research Design

The type of research conducted is descriptive-quantitative design research with *a cross sectional* design approach. The design of this research is used to research an event at the same time (one time). So that dependent variables and independent variables are studied at the same time. In this study, it examines "The Relationship between *Self-Care Management and Sleep Quality* to Quality of Life in Diabetes Mellitus Patients in the Working Area of the Sawah Lebar Health Center, Bengkulu City 2026"

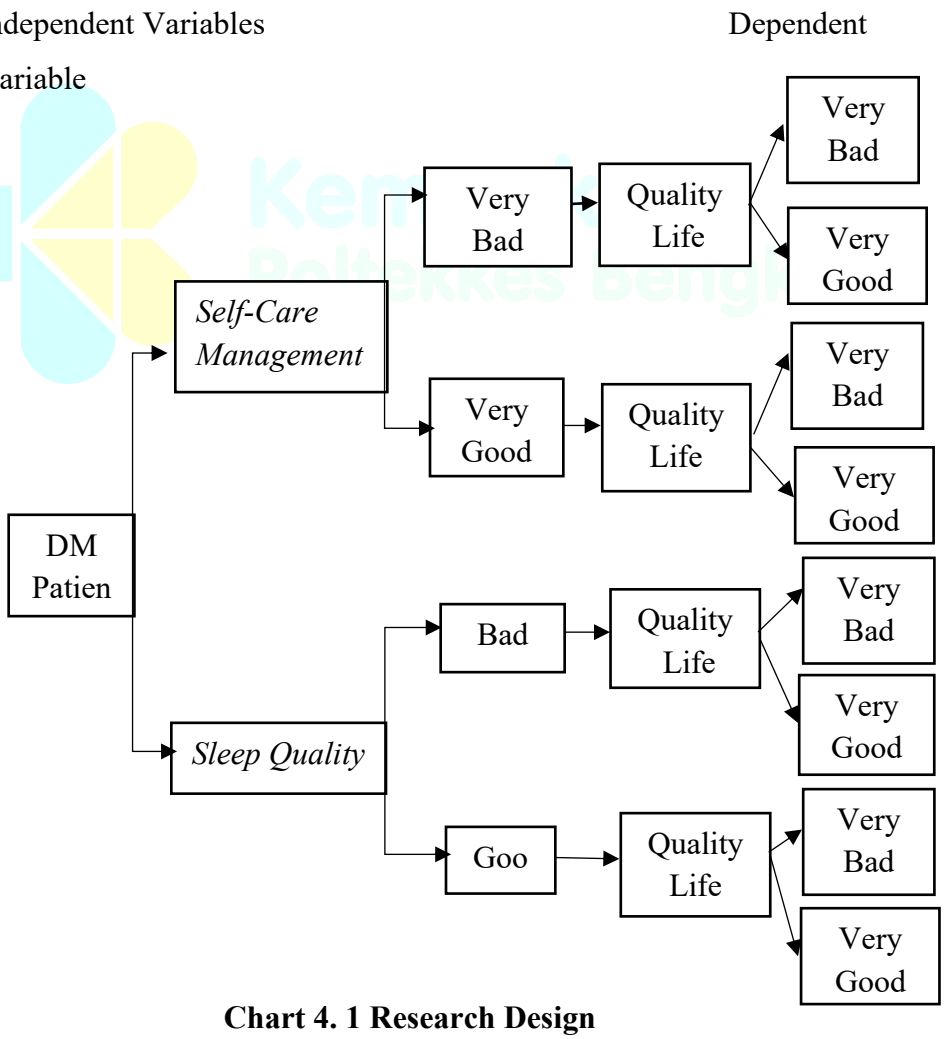

Chart 4. 1 Research Design

B. Research Variables

In this study, independent variables (independent variables) and dependent variables (bound variables) were used. The independent variables in this study are *Self-Care Management and Sleep Quality*. Meanwhile, the dependent variable in this study is quality of life.

C. Research Location and Time

1. Location

   This research was conducted at the Sawah Lebar Health Center, Ratu Agung District, Bengkulu City

2. Time

   This research will be conducted in February 2026

D. Population and Sample

1. Population

   Population is a generalization that consists of objects and subjects that have certain characteristics and characteristics that will be determined by the researcher and will be drawn conclusions at the end. The population in this study is patients who have a medical diagnosis of DM in the Sawah Lebar Health Center area in the January-July period of 2025 with a total of 136 DM patients.

2. Sample

   A sample is a fraction of the number of individuals with characteristics that represent the population to be studied (Ahmad, 2022). The sample in this study was a patient with a medical diagnosis of DM in the working area of the Sawah Lebar Health Center in Bengkulu City, namely DM respondents. The selection of research samples was determined using *No Probability Sampling* with Techniques *Purposive Sampling*. The sample used was respondents who met the inclusion and exclusion criteria:

   a. Inclusion Criteria

      1) Respondents are willing to participate in the research
      2) Respondents are able to understand and follow instructions

3) Respondents with a healthy state so that they are able to fill out the questionnaire until the end
4) Able to communicate well and clearly
5) Respondents with type 1 DM and type 2 DM

b. Exclusion Criteria

1) Respondents who resigned and did not follow the study until it was completed
2) People with diabetes mellitus experienced worsening health conditions that inhibited participation during the study.

3. Large Sample

Sample counting formula

$$n = \frac{Z2 \; x \; P \; x \; Q}{d2}$$

Description:

Z = 95% Confidence Level

P = Proportion 0.5

Q = 1-P

d = Error rate of 5% or 0.05

n = Total Population 136

Based on the number of populations, which is 136 people, the sample calculation is as follows:

Count the initial sample (n_0) :

$$n_0 = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2}$$

$$n_0 = \frac{3.8416 \times 0.25}{0.0025} = \frac{0.9604}{0.0025} = 384.16$$

Corrections with limited populations (N = 136)

$$n = \frac{384.16}{1 + \frac{(384.16 - 1)}{136}}$$

$$n = \frac{384.16}{1 + \frac{383.16}{136}} = \frac{384.16}{1 + 2.817} = \frac{384.16}{3.817} = 100.6$$

So the sample of this study is **101 people**

E. Data Collection

1. Data Sources

a. Primary data

The method of data collection is as follows:

1) The data was taken directly by researchers from respondents who experienced DM who carried out controls at the Sawah Lebar Health Center, Bengkulu City.
2) The researcher provides *informed consent* to explain to the prospective respondents about the research plan including the objectives, benefits and length of the research time and explains the inclusion criteria for the prospective respondents that the researcher wants.
3) Furthermore, respondents who meet the inclusion criteria will provide a statement of consent to become. If the prospective respondent refuses, the researcher cancels to become a research respondent.
4) Interviews and questionnaires were used to obtain information about the characteristics of the respondents which included age, gender, type of diabetes mellitus, length of time with diabetes mellitus, type of therapy undergone, and family history.
5) Interviews and filling out the WHOQOL-BREF questionnaire to measure quality of life, PSQI to measure *sleep quality,* DSMQ to measure *self care management*

6) The results of data recording are then processed with the SPSS application program

b. Secondary Data

Secondary data in this study was obtained from the Bengkulu City Health Office and the Sawah Lebar Health Center in Bengkulu City in the form of the number of people with diabetes mellitus in 2024.

2. Data Collection Tools and Research Instruments

a. Data Collection Form

The form used to obtain patient data contains the respondent's number, day/date, respondent's initials, age, gender, type of DM, length of time in DM, type of therapy undergone, and family history.

b. Filling out the WHOQOL-BREF questionnaire to measure quality of life

c. Filling out the PSQI questionnaire to measure *sleep quality*

d. Filling out the DSMQ questionnaire to measure *self care management*

3. Data Collection Procedures

a. Perform *informed consent*

The researcher will ask about the ability as a respondent and explain the benefits and objectives of the research to be carried out

b. Explanation of filling out the questionnaire

The researcher will explain how to fill out the questionnaire

c. Questionnaire

Respondents fill out a questionnaire and are accompanied by researchers

d. Data management

Researchers carry out data management and analysis

4. Test Data Collection Tools

a. Questionnaire *Self-Care Management*

The *Diabetes Self-Management Questionnaire (DSMQ) instrument* is used to measure an individual's ability to manage themselves in the treatment of diabetes mellitus, including aspects of dietary regulation,

physical activity, blood glucose level monitoring, and adherence to therapy. Validity and reliability tests of the DSMQ have been widely performed on various populations. The results of the latest research by Schmitt et al. (2022), show that the revised version of the DSMQ (DSMQ-R) has good construct validity, as evidenced by the analysis of confirmatory factors with *a goodness of fit* value that meets the criteria (CFI = 0.95; RMSEA = 0.06). *Cronbach's Alpha* value is 0.84, indicating good internal consistency across all subscales. In this study, DSMQ will be used in an Indonesian adaptation version with a content validation procedure through a panel of experts (3–5 experts in the field of nursing and endocrinology). Items that have *an item-total correlation* value of ≥ 0.30 will be declared valid, and the overall reliability will be calculated using *Cronbach's Alpha coefficient,* with an acceptance limit of ≥ 0.70 (Sopiyudin, 2024).

b. Questionnaire *Sleep Quality*

Sleep quality is measured using *Pittsburgh Sleep Quality Index (PSQI)* developed by Domingo et al., (2021). The instrument consists of 19 items that assess seven components of sleep quality, namely sleep duration, efficiency, sleep disturbances, use of sleep medications, sleep latency, daytime disturbances, and subjective sleep quality. Based on research Wang et al., (2022) PSQI shows good construct validity with a value *Loading Factor* > 0.40 on all components, as well as high reliability with Cronbach's Alpha value = 0.83. A recent study by Sohrabi et al,. (2024) also shows that PSQI has a stable factor structure in various clinical populations with consistent reliability in this study, the Indonesian version of PSQI that has gone through the process of cultural adaptation will be used. The validity of the content is tested through expert assessment, while reliability is measured using *Cronbach's Alpha* with a minimum value of 0.70 as an indicator of adequate internal consistency. Items with a low correlation (< 0.30) will be evaluated for repair or removal.

c. Quality of Life Questionnaire

The *World Health Organization Quality of Life–BREF (WHOQOL-BREF)* instrument is used to comprehensively measure an individual's quality of life level, covering four main domains: physical, psychological, social, and environmental. Research by Almarabheh et al. (2023) reported that WHOQOL-BREF has high construct validity and reliability, with the results of confirmatory factor analysis showing CFI values = 0.92 and RMSEA = 0.07, as well as Cronbach's Alpha values of 0.89. This shows that WHOQOL-BREF is a consistent and reliable measuring tool for assessing the quality of life in various populations. In this study, the Indonesian version of WHOQOL-BREF will be used by testing the validity of the content by experts in the fields of nursing and public health. Reliability is measured by Cronbach's Alpha, and a value of ≥ 0.70 would be considered to have good internal consistency. The validity of the construct can be tested using exploratory factor analysis (EFA) to ensure the suitability of the domain structure in the context of the study respondents.

F. Data Processing

According to Kamaruddin and Yanis, (2023) Data processing is a series of activities to collect and organize data from each research variable so that the data is in a form that is ready to be analyzed and evaluated. Here is how data is processed in quantitative research:

1. *Editing*

   The results of the data collection obtained are then edited first. After that, the sheets that have been collected are checked again for completeness of the data.

2. *Coding*

   The data that has been collected and checked will be coded as a separator.

3. *Sorting*

   The data grouped by coding were separated for inclusion in the intervention group.

4. *Entry and Processing*

   The answers and responses obtained from the respondents are then entered into the SPSS program and the letters become numerical or numerical data.

5. *Cleaning*

   After all the data is entered, then the data is checked again starting from code errors, incompleteness and then justification or correction is made. This process is called the data *cleaning process.*

G. Data Analysis

1. Univariate Analysis (Descriptive analysis)

   Univariate analysis was used to describe the characteristics of respondents which included age, gender, type of diabetes mellitus, length of time with diabetes mellitus, current blood glucose levels, and type of therapy used. To conduct a univariate analysis of categorical data, namely gender, type of diabetes mellitus, and type of therapy undergoing, obesity, frequency or percentage distribution was used.

2. Bivariate Analysis

   Bivariate analysis aims to see the relationship between two variables, namely independent variables and dependent variables. Bivariate analysis also provides results regarding the proof of the proposed hypothesis. The bivariate analysis of this study was carried out using the statistical test *Chi Square* (α) = 0.05 (5%). This study uses a chi-square statistical test because independent variables and dependent variables are categorical. To see the meaning of the variable relationship statistically, the degree of significance (α) = 0.05 is used with the interpretation of the results as follows:

   a. If $p \leq \alpha$: then Ha is accepted and HO is rejected, there is a relationship between *Self-Care Management and Sleep Quality* to Quality of Life

in Diabetes Mellitus Patients in the Working Area of the Sawah Lebar Health Center, Bengkulu City.

b. If $p > \alpha$: then H_a is rejected and H_O is accepted, there is no relationship *between Self-Care Management and Sleep Quality* to Quality of Life in Diabetes Mellitus Patients in the Working Area of the Sawah Lebar Health Center, Bengkulu City.

3. Multivariate Analysis

Multivariate analysis is used to find the relationship between many independent variables and a bound variable. The analysis used in this study is a logistic regression analysis in *Self-Care Management and Sleep Quality*. The selection of the analysis is determined by the measurement scale of the bound variable because it uses a categorical scale in the variable *Self-Care Management and Sleep Quality*. The steps of multivariate analysis are as follows (Lamba and Maris, 2021):

a. Select variables to be included in multivariate analysis. The variables included in the multivariate analysis are those that in bivariate analysis have a $p<0.25$ value.

b. Multivariate analysis of both logistic regression and linear regression using *the backward* method. In the *backward method*, *the software* will automatically enter all the selected variables to be included in the *multivariate*. Gradually, the variables that have no effect will be excluded from the analysis. The process will stop until there are no more variables that can be excluded from the analysis.

c. Interpret results. Some of the things that can be gained from multivariate analysis are as follows:

1) The variables that affect the bound variable are known from the p-value of each variable.

2) The order of the strength of the relationship of the variables that affect the bound variables. In logistics regression, the correlation sequence is known from the magnitude of the Odds Ratio (OR) value.

H. Research Flow

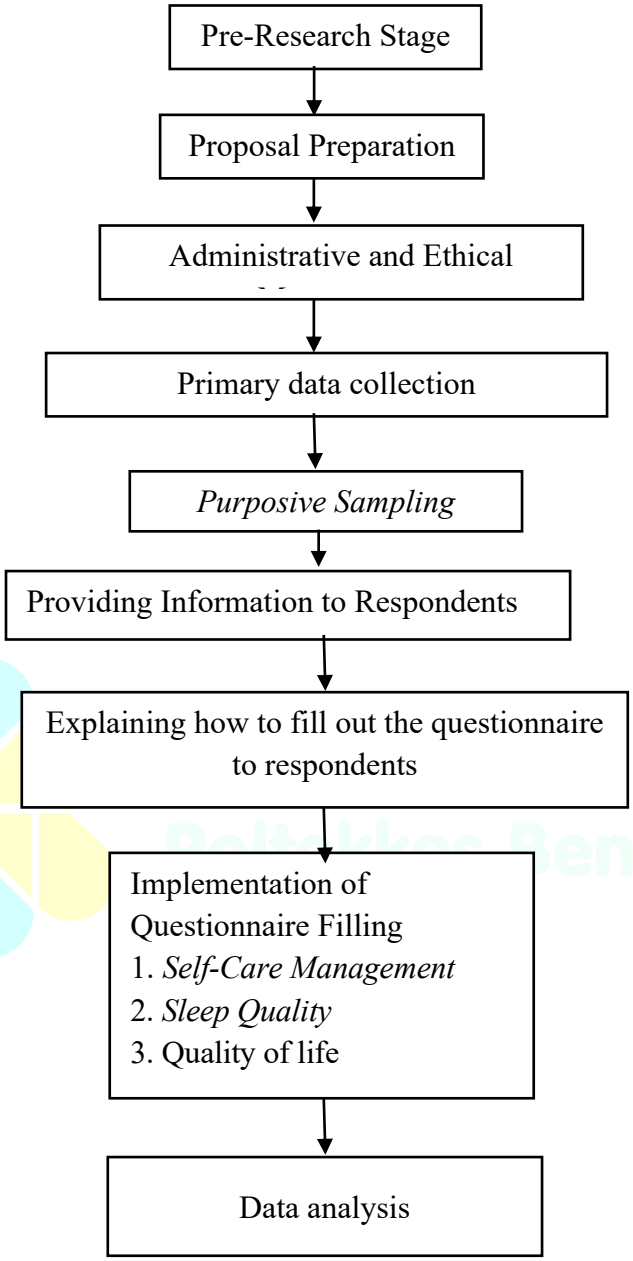

Chart 4. 2 Research Flow

I. Research Ethics

The researcher considers the ethics and legality of the research to protect respondents to avoid all physical and psychological dangers and discomfort (Haryani & Setyobroto, 2022). By observing the following ethical principles:

1. *Self Determinant*

   In this study, respondents were given freedom when choosing and deciding whether or not to participate without coercion.

2. *Anonymity*

   The respondent's name was listed with the initials on the research result and the researcher only used a numerical code.

3. Confidentiality

   All information obtained from respondents is guaranteed to be confidential and not disseminated/disclosed to others. The researcher stores the data in the form of *a soft file* on the researcher's laptop and only exists on *the researcher's* drive.

4. Justice

   The researcher treated the respondents fairly, without partiality or gave special treatment to certain respondents by giving the same questionnaire.

5. The Principle of *Beneficiency*

   Respondents who participated in this study obtained information and knowledge about the importance of implementing good *self-care management* and maintaining optimal *sleep quality* as an effort to manage DM to improve the quality of life of DM sufferers.

6. *Nonmaleficience*

   Respondents received direct assistance from researchers when filling out the questionnaire to obtain accurate data and avoid bias.

J. Activity Schedule Has Been Carried Out

Research activities will be carried out with the following schedule:

Table 4. 1 Research Flow

Yes	Activities	Moon											
		9	10	11	12	1	2	3	4	5	6	7	8
1	Completion of Research Proposals	■	■										
2	Research Proposal Seminar Exam			■									
3	Revision of Thesis Proposal and Endorsement			■	■								
4	Collection of Thesis Proposals to Study Programs				■								
5	Ethical Clearance Management					■							
6	Management of Permit Introduction and Data Collection					■							
7	Initial Survey						■						
8	Implementation of research and data collection						■	■					
9	Entry, Analysis and Interpretation of Research Results Data								■				
10	Preparation for Writing Results Report								■				
11	Thesis Exam									■			
12	Thesis Revision									■			
13	Thesis Validation with Examiners and Head of Study Program									■			
14	Collection of Thesis to Study Program										■		
15	Drafting Manuscripts										■		
16	Submit Manuscripts to Scientific Journals											■	
17	Submitting LOA for the publication of journal articles to the study program												■
18	Collection of articles that have been published to study programs												■