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EFFECTIVENESS OF DIABETES MELLITUS COUNSELING IN IMPROVING DIETARY COMPLIANCE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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ABSTRACT

Type II diabetes mellitus is a chronic disease in which the pancreas does not produce enough insulin resulting in an increase in blood glucose levels above normal. The population in this study were 94 people with type II diabetes meatus. The sample needed is 40 patients. Data collection in this study was through distributing questionnaires and counseling. The data analysis used is descriptive statistical analysis and analysis using the t test. The results of data collection will go through several stages including validity test, reliability test, normality test, and homogeneity test. Based on the analysis of the t-test sample test, the results of statistical tests with the paired samples test showed a P-value value of 0.027 <0.05, which can be concluded that there is an effectiveness of diabetes mellitus counseling in improving diet compliance with type II diabetes mellitus.

Introduction

Worldwide, type 2 diabetes mellitus ranks high among non-communicable illnesses in terms of prevalence and death. Impaired glucose metabolism owing to insulin resistance and/or reduced insulin production characterizes the progressive condition. Lifestyle changes, increased urbanization, and bad eating habits are all contributing factors to the rising incidence of type 2 diabetes in Indonesia. Hypertension, dyslipidemia, and decreased renal function are common consequences in type 2 diabetic patients. In clinical practice, one of the most prevalent associations is the significant link between blood sugar levels and blood pressure

The insufficiency of insulin production by the pancreas causes elevated blood glucose levels in type II diabetes mellitus, a chronic condition (PERKENI, 2018; Cumatunaro et al., 2020). Patients with type 2 diabetes mellitus are more likely to have hypertension, dyslipidemia, and cardiovascular disease, which is two to four times more than in the general population. Furthermore, individuals with type II diabetes mellitus typically exhibit bad behavior and are not cooperative with medication intake due to the duration of therapy, leading to unmanageable sugar levels. One approach is to engage in counseling activities. Research has shown that counseling may help patients better understand their condition and make healthier dietary choices, which in turn can lead to better blood sugar management (Yanti et al., 2024). (Yanti et al., 2024) .

In 2023, the World Health Organization reported that non-communicable illnesses accounted for 73% of all fatalities. Of these, 35% were attributable to cardiovascular disease, 12% to cancer, 6% to chronic obstructive pulmonary disease, 6% to diabetes, and 15% to other non-communicable diseases. There was an increase of 1.8 per mile in cancer, 10.9 per mile in stroke, 3.8 per mile in chronic renal disease, 8.5% in diabetes mellitus, and 34.1% in hypertension between 2013 and 2018, according to data from Riskesdas (Pramono & Luzida Azmi Aurelia, 2024). With 10.7 million people affected, Indonesia ranks seventh among the top ten nations for diabetes mellitus cases in 2019, according to the International Diabetes Federation. The

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estimated prevalence of IDF diabetes in 2019 was 9.6% among males and 9% among women (Ariyani & Rahmani, 2022).With an estimated 570,611 cases, the diabetes mellitus prevalence in West Java reached 1.74%. There were 46,837 cases of diabetes mellitus in 2021, according to the West Java Health Office. In 2020, 139,392 individuals were found to have diabetes, according to data from the West Java Provincial Health Office (2022). Researchers Muzharaffah and Simamora (2023). According to the 2019 Non-Communicable Disease Control Program of the Sukabumi District Health Office, diabetes mellitus has been listed as one of the top 10 non-communicable illnesses over the last decade. Out of the top ten illnesses, hypertension ranks second, followed by diabetes mellitus, asthma, coronary heart disease, stroke, chronic obstructive pulmonary disease, thyroid disease, injuries sustained in traffic accidents, osteoporosis, and obesity. Out of a total of 9014 cases, three areas in Sukabumi District had the greatest concentration of diabetes mellitus in 2017. These regions are Region I, Region IV, and Region VI. There were 1235 instances out of 496,856 in Region I of Sukabumi District. (Mulyadi & Basri, 2021) .

Advising on Health Counseling is structured according to a predetermined model, procedure, style, or system. The Ministry of Social Affairs (2014) defines mentoring as an activity that empowers communities via communication, facilitation, and dynamization. Listening attentively, communicating messages that inspire, invite, provide ideas or solutions, provide services or help, give counsel, recommend, mobilize, and collaborate are all ways to provide aid. (Anwar & Karota, 2019) .

Patients with type II diabetes mellitus have a significant obstacle in the form of behavioral and social norm adjustments that are necessary for them to adhere to their prescribed eating regimen. The additional complications of type 2 diabetes may be lessened by following a diet specifically designed for type 2 diabetes. The patient's inability to adhere to a rigid diet that includes the correct quantity, timing, and kind of food is the primary challenge in managing a kind II Diabetes Mellitus diet. (Asmira et al., 2023) .

Data from studies (Sucipto, 2019) indicate that... Although the exercise group did not show a significant difference in adherence (p value = 0.549), the results demonstrated that the intervention group had significantly higher adherence before and after counseling (diet p = 0.001; control p = 0.002; p = 0.000 number of pills; GDPP p = 0.000).As per the findings of the study (Anwar & Karota, 2019). Prior to and after health counseling, there were statistically significant variations in the groups' ability to regulate their blood sugar levels (p = 0.000 for the intervention group and p = 0.011 for the control group). This proves that health counseling has an impact on helping people with diabetes mellitus regulate their blood sugar levels.

According to the results of research (Setyaji et al., 2023) . Research has shown that (Setyaji et al., 2023). The pre-test findings indicated that out of the total number of respondents, 28 (80.0%) had an adequate level of knowledge, while 4 (11.4%) had an excellent level of knowledge. Among the 29 responders, 100% demonstrated comprehension of the presented information in the post-test. Community diabetes counseling programs have shown that its participants gained more information about the disease and its prevention and management. The assessment findings reflect this by comparing the community's or respondents' knowledge levels before and after the intervention.

Wulandari et al. (2021) investigated the impact of dietary counseling on type 2 diabetes patients' adherence to their treatment plans. Four sessions of personalized nutrition counseling resulted in a significant improvement in dietary compliance among Puskesmas patients. In addition, a study by Nugroho and Lestari (2020) titled "The Effect of Education and Counseling on Blood Sugar Control in DM patients" shown that patients who had organized counseling saw a more significant reduction in HbA1c levels compared to the control group. Consequently, the objectives of this research are to ascertain whether or not counseling for type II diabetes mellitus improves dietary compliance at Ciracap health center, to compare the dietary compliance of

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patients who have and have not received counseling, and to examine the dietary compliance of patients in the control group who have and have not received counseling.

Method

The type of research used in this study is the *quasi experiment* method, according to (Ariyani & Rahmani, 2022) Research employing intervention on study participants to ascertain the effects of post-intervention changes is known as quasi-experimental research. In this research, 94 individuals diagnosed with type II diabetes mellitus made up the population. Based on the work of Ann Dempsey and D. Dempsey (2002), the researchers in this study determined that a minimum of 15 individuals per group would be sufficient for experimental research. To account for any dropouts, a 35% corrective sample was also included. for straightforward research with robust experimental control, 10–20 people per group is often considered the bare minimum. The researcher selected 20 participants for each group based on this idea. twenty subjects for the study's experimental group and twenty subjects for the comparison group. It follows that forty individuals afflicted with type 2 diabetes mellitus residing in the Ciracap Health Center's operational area will constitute the necessary sample. The sample is chosen at random, unconcerned with stratification, since this sampling method employs a basic random sampling procedure.

"The sample used is based on:

a. Inclusion criteria
   1) Respondents with blood sugar levels > 180 mg/dl.
   2) Respondents with a history of type II diabetes mellitus.
b. Exclusion criteria
   1) The respondent refused the intervention.
   2) Respondents who do not have a history of type II diabetes mellitus."

Questionnaires and therapy sessions were used to gather data for this research. Descriptive statistics and t-test analysis were used for the data analysis. Several tests, such as those for validity, reliability, normalcy, and homogeneity, will be run on the collected data. A questionnaire that has been tailored to the study goals, research variables, and theory-informed design will be used as the data collecting instrument. Dietary compliance (Y) and counseling (X) are the factors that have been changed in the questionnaire.

Using SPSS for Windows, we tested the instrument's validity test. According to Nurhidayat's (2017) study in Situmorang (2022), the dietary adherence questionnaire was found to be valid with an r-count value of 0.689> r-table 0.444 out of 20 respondents.

The Cronbach Alpha (α) value is often used for reliability assessment; a variable is said to possess a high degree of reliability if the r-alpha is positive and surpasses the r-table. The dietary compliance questionnaires used in the study by Nurhidayat (2017) were found to be trustworthy in a Chronbach Alpha test with a value of 0.910> r-table 0.444, as reported in Situmorang (2022).

Results

Univariate Analysis

a. Gender

The researcher identifies the respondents according to their gender before presenting the findings of this thesis study.

Table 1. Distribution of respondent characteristics based on gender (n=20)

Gender	Frequency (people)	Percentage (%)
Male	7	35,0%
Female	13	65,0%

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Total	20	100%

Based on table 1 shows that the male gender amounted to 7 (35.0%), and the female gender was 13 people (65.0%). The majority of gender is female as many as 13 people (65.0%).

b. Age

The gender breakdown is as follows: 13 females and 7 males, or 35.0% and 65.0% of the total, respectively, as shown in table 1. Thirteen individuals, or 65.0% of the total, identify as female.

Table 2. distribution of respondent characteristics based on age (n=20)

Variables	Average	Std. deviation	minimum	Maximum
Age	54,00	7,883	36	62

According to table 2, the participants in this research had an average age of 54.00 years, ranging from 36 years old at the youngest to 62 years old at the oldest.

a. Education

Table 2 shows that the ages of the study participants ranged from 36–62 years old, with an average age of 54.00 years.

Table 3. distribution of respondent characteristics based on age (n=20)

Recent education	Frequency (people)	Percentage (%)
SD	13	65,0%
SLTP	6	30,0%
HIGH SCHOOL	1	5,0%
Total	20	100%

Table 3 reveals that thirteen individuals (65.0%) have completed elementary school, six people (30.0%) have completed junior high, and one person (5.0%) has completed high school. Thirteen individuals, or 65.0%, have completed elementary school as their most recent educational attainment.

a. Jobs

Before explaining the results of this thesis research, the researcher first describes the identity of the respondents based on work.

Table 4. distribution of respondent characteristics based on occupation (n=20)

work	Frequency (people)	Percentage (%)
Farmers	5	25,0%
Housewife	13	65,0%
labor	2	10,0%
Total	20	100%

Table 4 reveals that out of the total workforce, 5 individuals (25.0%) were farmers, 13 (65.0%) were housewives, and 2 (10.0%) were workers, with 13 (65.0%) being the largest group of housewives.

a. Overview of dietary adherence before intervention

Looking at Table 4, we can see that out of the entire workforce, there were 5 persons who were farmers (25.0%), 13 housewives (65.0%), and 2 workers (10.0%), with the biggest number of housewives being 13 (65.0%).

Table 5. Overview of dietary adherence before intervention (n=20)

compliance	Average	Std. deviation	minimum	Maximum
pretest	36,50	11,377	15	60

According to Table 4, out of the total workforce, 5 individuals were farmers (25.0%), 13 were housewives (65.0%), and 2 were workers (10.0%), with 13 being the largest number of housewives (65.0%).

Table 6. overview of blood glucose values before the intervention (n=20)

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Glucose	Average	Std. deviation	minimum	maximum
pretest	229,00	57,324	202	446

Table 6 shows the description of blood glucose values before intervention.

a. Overview of dietary adherence after the intervention

The pre-intervention blood glucose readings are described in Table 6.

Table 7. description of dietary compliance after intervention (n=20)

compliance	Average	Std. deviation	minimum	Maximum
posttest	45,00	6,651	29	53

Table 7 reveals that out of the sample of people who participated in this research and were surveyed, the average level of compliance among those who received the intervention was 45 out of 100, with a range of 29 to 53.

Table 8. overview of blood glucose values after intervention (n=20)

Glucose	Average	Std. deviation	minimum	maximum
posttest	187,50	46,645	157	350

Table 8 shows the picture of blood glucose values after the intervention.

***Bivariate* analysis**

a. Normality Test

1) Test of Normality of Dietary Adherence Among:

Table 9. normality test for dietary adherence

Dietary compliance	*Saphiro-Wilk P-value*	Conclusion
Pre-Intervention	0,627	Normal
Post Intervention	0,209	Normal

Table 9 shows that the diabetic mellitus diet adherence variable passed the normalcy test with a p-value of 0.627 before the intervention and a p-value of 0.209 after the intervention, both of which are larger than the significance level of 0.05. Additionally, this establishes that the variable measuring dietary adherence follows a normal distribution.

b. Homogeneity Test

1) Homogeneity test for dietary adherence

The following are the results of the homogeneity test for dietary adherence:

Table 10. homogeneity test for dietary adherence

Variable	Levene test value	P-value
Dietary adherence	5,101	0,030

According to the findings of the homogeneity test on the diet compliance variable (table 10), the P-value is higher than 0.05. The data variance of the compliance value is uniform because the sig value is 0.30> 0.05.

2) Hypothesis Test

The purpose of the paired samples test was to find the mean value of two groups that were similar; in this case, we wanted to know how well diabetes counseling worked at Ciracap puskesmas in getting people with type II diabetes to follow their diet plans.

1) Analysis of the effectiveness of diabetes mellitus counseling in improving dietary compliance of type II diabetes mellitus

An evaluation of diabetes mellitus counseling's efficacy in enhancing dietary adherence in type II diabetics found the following outcomes:

Table 11. *paired samples test*

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II diabetes mellitus dietary compliance in the Ciracap puskesmas working area.

2) Analysis of the effectiveness of diabetes mellitus counseling in improving dietary compliance of type II diabetes mellitus

Based on table 11 shows the results of statistical tests with the *paired samples test,* the *P-value* obtained is 0.027 <0.05, which can be concluded that there is an effectiveness of diabetes mellitus counseling in improving diet compliance for type II diabetes mellitus.

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 COMPLIANCE PRE-TEST - COMPLIANCE POST-TEST	-6,550	12,206	2,729	-12,263	-,837	-2,400	19	,027

Discussion

Overview of Dietary Compliance in patients with type II Diabetes Mellitus

Twenty participants were surveyed about their dietary compliance in type II diabetes mellitus patients. Prior to the intervention, the average compliance value of the participants was 36.50, which is considered to be below the recommended level. The study's findings corroborate this. According to Laumara et al. (2021) It is evident from the pretest mean value of respondent compliance of 43.03 with a standard deviation of 23.411 and a minimum-maximum value of 6 to 90 that the majority of respondents, prior to counseling, exhibited inadequate compliance, particularly with regard to DM. As a result, it is clear that respondents' compliance levels are still poor prior to counseling.

Type II diabetes mellitus patients' dietary compliance was the subject of a survey with twenty participants. The participants' average compliance value was 36.50 before the intervention, which is below the acceptable limit. This is supported by the study's results. Laumara et al. (2021) found that most respondents showed insufficient compliance before counseling, especially with regard to DM, based on the following data: a mean of 43.03 with a standard deviation of 23.411 and a minimum-maximum value of 6 to 90. Consequently, it is evident that respondents' levels of compliance before counseling are still low.

Analysis of the Effectiveness of Diabetes Mellitus Counseling in Improving Dietary Adherence in Patients with Type II Diabetes Mellitus

Twenty people were surveyed on their adherence to their diabetes mellitus diet. Prior to the intervention, the participants' average compliance value was below the permissible level at 36.50. The findings of the research corroborate this. According to the data presented by Laumara et al. (2021), the majority of participants exhibited inadequate compliance before to counseling, particularly in relation to DM. The given data includes a mean score of 43.03, a standard deviation of 23.411, and a range of 6 to 90. Thus, it is clear that respondents' compliance levels prior to counseling remain low.

Conclusion

Results from this study's sample of 20 respondents reveal that, before the intervention, respondents' average compliance was 36.50, with a range of 15–60.

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Results from this study's sample of 20 respondents reveal that, following the intervention, respondents' average compliance was 45.00, with a range of 29–53.

We may infer that diabetic mellitus counseling is beneficial in increasing diet compliance with type II diabetes mellitus based on the results of statistical testing using the paired samples test, which revealed a P-value of 0.027 <0.05.

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