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The Influence of Patient Attendance for 5 Years in Prolanis (Chronic Disease Management Program) on Body Mass Index and Chronic Disease Parameters

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ABSTRACT

Background: Chronic diseases such as diabetes and hypertension are one of the biggest causes of death in the world and in Indonesia. Social Insurance Administration Organization or Badan Penyelenggara Jaminan Sosial (BPJS) Kesehatan, a health insurance in Indonesia, has a chronic disease management program or prolanis Patients who follow the prolanis program follow the prolanis program process for years. **Objective:** This study looks at whether patients who have followed the prolanis program for 5 years from 2019 to 2023 get good output results of health parameters such as blood pressure, HbA1c, Total Cholesterol, LDL, HDL, Ureum, Creatinine, and eGFR. **Methods:** This research method is a quantitative analytic retrospective on 151 patients who participated in the prolanis program during the period 2019 to 2023 with a pre-post retrospective research design. Normality tests were performed on all variables to determine the distribution of data distribution and bivariate analysis. The parameters assessed were Body Mass Index, HbA1c, Total Cholesterol, LDL, HDL, Triglycerides, Ureum, Creatinine, eGFR and Blood Pressure. **Results:** The results showed that significant differences occurred in the values of HbA1c, ureum, creatinine, and eGFR parameters in the group of patients with attendance ≥40 months. The Δ value from 2023 to 2019 has a significant difference (p-value <0.05) based on the HbA1c variable which increased in value in the ≥40 months attendance group, and decreased in value in the <40 months attendance group, then there was no significant difference in the value of other parameters in all attendance groups. For hypertension, the highest incidence of hypertension occurred in attendance <40 months less than attendance ≥40 months so that there was no relationship between attendance and blood pressure values in the last year (year 2023). **Conclusions:** It was concluded that attendance for 5 years with attendance ≥ 40 months was beneficial in maintaining eGFR function compared to attendance < 40 months. However, it has not been proven to be beneficial in maintaining the stability of HbA1c in the attendance group ≥ 40 compared to the attendance group < 40 months. Although there was an increase in ureum and creatinine, attendance ≥ 40 months proved to be able to maintain the stability of ureum and creatinine in normal numbers. From the results of the study, the highest incidence of hypertension occurred in attendance ≥40 months compared to attendance <40 months, so there is no relationship between the number of attendance with blood pressure values.

Keywords: *Attendance, creatinine, eGFR, HbA1c, HDL, hypertension, LDL, prolanis, total cholesterol, type 2 diabetes mellitus, ureum.*

INTRODUCTION

Chronic diseases are the number one cause of death in Indonesia, so the treatment of chronic diseases must be handled properly. According to data from the World Health Organization (WHO), chronic diseases such as diabetes, hypertension, and heart disease account for about 71% of total deaths worldwide[1].

Chronic diseases are the number one cause of death in Indonesia, so the treatment of chronic diseases must be handled properly. According to data from the World Health Organization (WHO), chronic diseases such as diabetes, hypertension, and heart disease account for about 71% of total deaths worldwide [2].

Because prolanis patients have carried out prolanis activities in the form of health consultations, health counseling, gymnastics, checking blood pressure, body

mass index every month and checking clinical parameters (HbA1c, Cholesterol, and kidney function) twice a year for the past few years. So a study was conducted to see the effect of patient attendance at the prolanis program on the results of health checks carried out routinely in the prolanis program[3].

Patient attendance in health programs such as prolanis is very important. This attendance not only reflects the patient's commitment to their health, but also affects the effectiveness of the program itself. Bodenheimer's (2002) research was subsequently supported by Hibbard's (2013) and Britt's (2018) research shows that patients who actively participate in disease management programs have better health outcomes compared to those who are not involved. Therefore, it is important to understand how patients' attendance over a certain period can affect their health outcomes[4,5,6].

METHOD

Research Design

The study included a descriptive-analytic-retrospective study with documentation techniques. The type of data taken is secondary data taken from the records of prolanis participants who participated in prolanis from January 2019 or the nearest in the same year to December 2023 or the nearest in the same year. This study is descriptive to describe the characteristics of respondents and analytical to assess the relationship between patient attendance and patient health outcomes of prolanis participants at the Mitra Sehati Clinic, Cibiru, Bandung.

Population and Samples

The population in this study were patients registered in the Prolanis Program at the Mitra Sehat Clinic for 5 years, namely prolanis patients who visited the Mitra Sehati Clinic during the period January 2019 to December 2023 who were registered before January 2019. This population includes patients who have been diagnosed with chronic diseases such as diabetes and hypertension, and participated in the prolanis program at the clinic from January 2019 to December 2023.

The sampling technique used total sampling with the inclusion criteria of prolanis patients diagnosed with diabetes and hypertension or both at the Mitra Sehati Clinic documented in medical records starting January 2019, patients who had at least 2 attendances, and for parameter data (BMI, total cholesterol, LDL, HDL, and blood pressure), initial attendance data were taken from January 2019 data or the closest throughout 2019 and final attendance data were taken from December 2023 data or the closest throughout 2023. The next inclusion criteria are for the initial attendance data on Ureum, Creatinine, and eGFR examinations taken from April 2020 data or the closest throughout 2020 and the final attendance data taken in October 2023 or the closest throughout 2023.

Exclusion criteria were patients participating in other prolanis such as asthma, epilepsy, Alzheimer's, heart disease and COPD, then prolanis patients who died in the period January 2019 - December 2023, and prolanis patients who had 0-1 attendance.

Obtained from 183 samples taken from the total sample of Mitra Sehati Clinic prolanis participants after inclusion and exclusion criteria, 151 samples were obtained..

Statistical Analysis

For univariate analysis in this study is descriptive analysis by describing categorical data in the form of frequency (n) and percentage (%) of respondents' sociodemographics and information on the history of diabetes mellitus in the treatment and control groups, and describing numerical data by describing the average value (mean), median, standard deviation, and minimum-maximum value range on each dependent variable then categorizing according to the operational definition.

For bivariate, retrospective data for 5 years were analyzed with *Kolmogorov* normality test if data >50 and *Saphero-Wilk* if data ≤50 to determine the distribution of data distribution. For BMI, HbA1c, Total Cholesterol, LDL, HDL, Ureum, Creatinine, and eGFR data, the test performed was using quantitative retrospective pre-post analysis using a dependent t-test or paired t-test for data that had a paired normal distribution, paired data that were not normally distributed used *Wilcoxon* analysis to see the average difference from the beginning and final year of data. Analysis of the difference or delta in 2023 -2019 because the data is not paired, the independent t-test is used for normal distributed data and the *Mann-Whitney* test for data that is not normally distributed to see the difference in the average delta in the two attendance groups. For hypertension, a correlation test was performed with Chi Square correlation to evaluate the relationship. Then for the hypothesis, z score and p value were sought with n : 5% and α value of 95% with p value ≤ 0.05 means meaningful (accepted).

Before conducting bivariate analysis, the data were first seen for distribution through Kolmogorov-Smirnov analysis on the entire attendance group based on a sample size of >50 and *Saphiro-Wilk* analysis for a sample size of ≤50. The conclusion of the distribution analysis results is that body mass index 2019-2023, LDL 2019-2023, HDL 2019, and eGFR 2020 have normal data distribution. Meanwhile, HbA1c 2019-2023, total cholesterol 2019-2023, HDL 2023, triglycerides 2019-2023, ureum 2020-2023, creatinine 2020-2023 and eGFR 2023 have abnormal data distribution.

The difference or delta (Δ) of each variable is issued to see the difference in parameter values between 2023 and 2019. The data were first examined for distribution through Kolmogorov-Smirnov analysis on the entire attendance group for a sample size of >50 and *Saphiro-Wilk* analysis for a sample size of ≤50. The conclusions of the distribution analysis results are Δ HbA1c with attendance <40 months and ≥40 months, Δ total cholesterol ≥ 40 months, Δ LDL and HDL with attendance <40 months and ≥40 months, Δ total cholesterol ≥ 40 months, Δ ureum <40 months, and Δ creatinine <40 months have normal data distribution.

Whereas, Δ body mass index with attendance <40 months and ≥40 months, Δ total cholesterol with attendance group <40 months, Δ triglycerides with attendance <40 months and ≥40 months, Δ ureum with group ≥40 months, Δ creatinine ≥40 months, and Δ eLFG with attendance <40 months and ≥40 months have non-normal data distribution.

RESULT

Descriptive Analysis Results

Data on prolanis patients with a diagnosis of diabetes and hypertension who participated in the prolanis program for 5 years (2019 to 2023) at the Mitra Sehati Clinic Bandung were 151 patients who met the inclusion criteria and exclusion criteria. Based on table 1, it is obtained explaining that the highest patient attendance is in the ≥40 month attendance group, namely 78 patients (51.7%) with an average attendance of 34.79 months. 89 (58.%) patients were female, with the most common diagnosis being hypertension as many as 94 patients (62.3%). The most registered patients were in the range of 1-5 years (60 patients; 39.7%).

Table 1. Prevalence of Respondent Characteristics

Variables	n	%
Patient Attendance (month)		
Attendance <40 months	73	48,3
Attendance ≥40 months	78	51,7
Gender		
Men	62	41,1
Women	89	58,9
Prolanis Diagnosis		
Diabetes Mellitus	23	15,2
Hypertension	94	62,3
Diabetes Mellitus and Hypertension	34	22,5
Month Registered		
<1 year	9	6,0
1-5 years	82	54,3
>5 years	60	39,7

Table 2. Frequency Distribution of Body Mass Index Values and Parameters of Respondents

Variables	Mean ± SD (Standard Deviation)	Median ± IQR (InterQuartile Range)	Range (Min-Max)
Body Mass Index 2019	26,4 ± 4.22	26,2 ± 5,42	19.0 – 38.3
Body Mass Index 2023	26,3 ± 4,17	25,8 ± 6,56	16,37 – 36,32
HbA1c 2019	7,76 ± 2,670	6,6 ±3,40	4,4 – 13,8
HbA1c 2023	7,78 ± 2,285	7,0 ± 2,5	4,9 – 13,2
Total Cholesterol 2019	211,6 ± 42,17	212,5 ± 49	129 – 325
Total Cholesterol 2023	212,1 ± 42,78	210,0 ± 49	120 – 348
LDL 2019	138,4 ± 37,15	137 ± 51	53 – 233
LDL 2023	137,1 ± 31,68	135 ± 43	62 – 230
HDL 2019	47,1 ± 12,21	46 ± 17	62 – 230
HDL 2023	49,6 ± 11,98	48 ± 15	22 – 90
Triglycerides 2019	170,7 ± 103,61	140,80 ± 93	27 – 590
Triglycerides 2023	165,2 ± 103,58	127 ± 122	57 – 532
Ureum 2020	26,1 ± 10,05	24 ± 12,5	3,50 – 59,00
Ureum 2023	29,2 ± 13,93	28 ± 17	1,54 – 96,00
Creatinine 2020	0,9 ± 0,29	0,8 ± 0,37	0,46 – 1,90
Creatinine 2023	1,0 ± 0,38	0,9 ± 0,38	0,46 – 2,77
eGFR 2020	81,7 ± 20,85	82 ± 29,50	29 – 124
eGFR2023	84,1 ± 111,63	71 ± 44,84	3,31 – 831,71

Based on Table 2, in all attendance groups, it was found that the average Body Mass Index of patients in 2019 was 27.0 kg / m2 with a minimum value of 19.0 kg / m2 and a maximum of 38.3 kg / m2 then decreased in average in 2023 by 26.2 kg / m2 with a minimum value of 16.37 kg / m2 and a maximum of 36.32 kg / m2. The median value of HbA1c in 2019 was 6.6% in 2019 with a minimum value of 4.4% and a maximum of 13.8%, then increased the median value of HbA1c in 2023 by 7.0% with a minimum value of 4.9% and a maximum of 13.2%. The average value of total cholesterol of patients in 2019 was 211.6 mg/dL with a minimum value of 129 mg/dL and a maximum of 325 mg/dL, then increased the average in 2023 by 212.1 mg/dL with a minimum value of 120 mg/dL and a maximum of 348 mg/dL. The average value of LDL Cholesterol of patients in 2019 is 138.4 mg/dL with a minimum value of 53 mg/dL and a maximum of 233 mg/dL, then increases on average in 2023 by 62 mg/dL with a minimum value of 22 mg/dL and a maximum of 230 mg/dL. The average HDL cholesterol value of patients in 2019 was 47.1 mg/dL with a minimum value of 62 mg/dL and a maximum of 230 mg/dL, then increased in 2023 by an average of 49.6 mg/dL with a minimum value of 22 mg/dL and a maximum of 90 mg/dL. The average triglyceride value of patients in 2019 was 170.7 mg/dL with a minimum value of 27 mg/dL and a maximum of 590 mg/dL, then decreased in 2023 by an average of 165.2 mg/dL with a minimum value of 57 mg/dL and a maximum of 532 mg/dL. The average value of

patient ureum in 2020 was 26.1 mg/dL with a minimum value of 3.50 mg/dL and a maximum of 59.0 mg/dL, then increased in 2023 by an average of 29.2 mg/dL with a minimum value of 1.54 mg/dL and a maximum of 96.0 mg/dL. The average creatinine value of patients in 2020 was 0.9 mg/dL with a minimum value of 0.46mg/dL and a maximum of 1.90 mg/dL, then increased in 2023 by an average of 1.0 mg/dL with a minimum value of 0.46 mg/dL and a maximum of 2.77 mg/dL. The average eGFR value of patients in 2020 was 81.7 mg/dL with a minimum value of 29 mg/dL and a maximum of 124 mg/dL, then increased in 2023 by an average of 84.1 mg/dL with a minimum value of 3.31 mg/dL and a maximum of 831.71 mg/dL.

Dependent T-test and *Wilcoxon* Analysis Results

Differences in Body Mass Index and Parameter Values of Prolanis Participants Assisted by the Mitra Sehati Clinic in 2019-2023 were carried out with dependent T-test and *Wilcoxon* analysis.

Table 3. Anthropometric Differences and Parameter Values of Prolanis Participants Assisted by the Mitra Sehati Clinic in 2019-2023

Variables	Year 2019		Year 2023		*t-paired*	*W-value (Z)*	*p-value*
	N	Mean±SD	N	Mean±SD			
Body Mass Index	127	26,5 ± 4,02	127	26,3 ± 4,17	1,032		0,304
HbA1c	44	7,4 ± 0,37	44	7,9 ± 0,35		-2,710	0,007*
Total Cholesterol	94	210,1 ± 4,51	94	211,38 ± 12,35		-0,373	0,709
LDL	91	137,1 ± 37,52	91	137+3 ± 30,65	- 0,066		0,948
HDL	95	47,8 ± 12,35	95	49,4 ± 11,84		-1,808	0,071
Triglyserides	78	173,9 ± 110,24	78	173,31 ± 108,65		-0,206	0,837
Ureum	80	25,7 ± 9,32	80	29,7 ± 14,80		-2,978	0,003*
Creatinine	82	0,89 ± 0,321	82	1,02 ± 0,406		-5,681	0,000*
eGFR	79	82,5 ± 21,02	79	88,32 ± 121,89		-4,772	0,000*

Based on Table 3, it was found that there were differences in the means in 2019 and 2023 in the variables of HbA1c, ureum value, creatinine value, and eGFR value (p-value <0.05). HbA1c value decreased by 0.2% with a t-paired value of 1.032, ureum value increased by 4.0mg/dL with a w-value (Z) of -2.978, creatinine value increased by 0.13mg/dL with a w-value (Z) of -5.681, and eGFR value increased by 5.82mg/dL with a w-value (Z) of -4.772. Other parameter variables did not show significant differences.

Table 4. Difference in BMI and Parameter Value of Prolanis Assisted by Mitra Sehati Clinic 2019 - 2023 Based on Attendance

Variables	Attendance <40 months					Attendance ≥40 months				
	Mean±SD	N	*t-paired*	*W-value (Z)*	*p-value*	Mean±SD	N	*t-paired*	*W-value (Z)*	*p-value*
Body Mass Index 2019	26,9 ± 3,89	49	-0,70	-	0,487	26,2 ± 4,22	78	0,76	-	0,448
Body Mass Index 2023	26,7 ± 3,34					26,0 ± 4,61				
HbA1c 2019	9,7 ± 3,27	6	-	-0,11	0,917	7,0 ± 2,17	38	-	-2,97	0,003*
HbA1c 2023	9,3 ± 2,47					7,6 ± 2,27				
Total Cholesterol 2019	209,8 ± 53,25	25	-	-0,31	0,757	210,3 ± 40,24	69	-	-0,28	0,781
Total Cholesterol 2023	212,5 ± 50,22					211,0 ± 40,52				
LDL 2019	141,1 ± 42,09	20	-0,59		0,564	135,9 ± 36,37	71	-0,49	-	0,629
LDL 2023	134,8 ± 36,33					138,0 ± 29,10				
HDL 2019	45,7 ± 12,45	21	-	-0,28	0,781	48,4 ± 12,35	74	-1,94	-	0,057
HDL 2023	46,6 ± 12,61					50,2 ± 11,58				
Triglyceride 2019	218,7 ± 163,38	13	-	-0,04	0,972	218,7 ± 163,38	65	-	-0,27	0,786
Triglyceride 2023	210,3 ± 141,17					210,3 ± 141,71				
Ureum 2020	22,5 ± 10,60	15	-	-0,94	0,347	22,5 ± 10,60	65	-	-2,88	0,004*
Ureum 2023	24,1 ± 11,41					24,1 ± 11,41				
Creatinine 2020	0,8 ± 0,36	14	-	-2,51	0,012*	0,8 ± 0,36	67	-	-5,17	<0,000*
Creatinine 2023	0,9 ± 0,32					0,9 ± 0,32				
eGFR 2020	91,5 ± 22,70	65	-	-2,86	0,004*	80,6 ± 20,31	65	-	-3,96	0,000 *
eGFR 2023	68,9 ± 35,83					92,5 ± 133,22				

Based on Table 4, a significant difference occurred in the value of the HbA1c parameter in the group of patients with attendance ≥40 months there was a significant difference with an average value of 7.04% in 2019 and increased to 7.64% in 2023 with a difference in value of 0.6% and a Z-value of -2.97, while there was no significant difference in the attendance group <40 months. The next significant difference occurred in the value of the ureum parameter attendance ≥40 months with an average value in 2019 of 22.47 and increased to an average of 24.13 mg/dL in 2023 with a difference in value of -4.62mg/dL and a Z-value of -2.88, while there was no significant difference in the attendance group <40 months. The next difference occurred in both groups for creatinine parameter values, it was known that the average creatinine parameter value in the <40 month group in 2020 was 0.82 and increased to 0.90mg/dL in 2023 with a difference of 2.51mg/dl, while in the ≥40 month attendance group the creatinine value increased from an average of 0.82 in 2020 to 0.90 in 2023 with a difference of 0.14. The next significant difference occurred in the eGFR value parameter in the <40 month attendance group, the average eGFR value in 2020 was 91.50 and decreased to 68.91 in 2023 with a difference of 22.59 and a t value of 0.76. While there was no significant difference in the ≥40 months attendance group, the difference in the average value in 2023 in both groups was 23.59 where the ≥40 months attendance group had a better GFR value compared to the <40 months attendance group.

Table 5. Difference in Anthropometric Values and Patient Parameter Values Between 2019 and 2023 Based on Attendance Category

	Variable	<40 months		≥40 months		t	U	p
		N	Mean ±SD	N	Mean ±SD			Value
Δ	BMI 2023-2019	49	-0,6±3,27	78	-0,2±2,13	-	1793	0,559
Δ	HbA1c 2023-2019	7	-1,3±3,23	38	0,6±1,14	-2,83	-	0,007*
Δ	Total Cholesterol 2023-2019	25	2,7±52,78	69	0,7±39,46	-	858,50	0,973
Δ	LDL 2023-2019	20	-6,4±48,31	71	2,1±37,17	-0,842	-	0,402
Δ	HDL 2023-2019	21	0,9±6,59	74	1,8±8,16	-0,51	-	0,615
Δ	Triglycerides 2023-2019	13	-8,4±95,92	65	0,9±70,53	-	394,50	0,707
Δ	Ureum 2023-2019	16	2,9±8,13	65	4,6±13,60	-	486,50	0,691
Δ	Creatinine 2023-2019	15	0,1±0,11	67	0,1±0,22	-	464,00	0,644
Δ	eGFR2023-2019	14	-22,59±34,04	65	11,92±130,34	-	448,00	0,928

Delta Value Analysis Results with Independent T Test and *Mann-Whitney*

Table 5 obtained about the difference value or Delta value from 2023 to 2019 there is a difference in the average value between the two groups (p-value <0.05), the attendance group <40 months has an average delta of -1.3% meaning that the average HbA1c value in 2023 decreased by 1.3% compared to 2019, while the average delta value of HbA1c attendance group ≥40 months is 0.6% meaning that there is an increase in HbA1c value from 2019 to 2023, the t value of the analysis of differences in HbA1c values based on the two attendance groups is -2.83. Other variables were found to have no significant differences in all parameter values and all attendance groups.

Table 6. Relationship between hypertension and patient attendance for 5 years (2019-2023)

Blood Pressure Value 2023	Normotension		Hypertension		total		p-value	OR (95% CI)
	n	%	n	%	N	%		
<40 months	22	84,6	4	15,4	26	100	0,813	1,164 (0,331 – 4,089)
≥40 months	64	86,5	10	13,5	74	100		
total	86	86	14	14	100	100		

Hypertension Data Results with Chi Square

Table 6 shows that the attendance group <40 months who suffered from hypertension was 4 patients (15.4%) compared to the group of patients with attendance ≥40 months who suffered from hypertension was 10 patients (13.5%). based on chi-square analysis there is no relationship between attendance group and blood pressure values (p-value>0.05) in the last year of examination (year 2023).

DISCUSSION

Differences in BMI, HbA1c, and Blood Pressure by Attendance Group

For Body Mass Index, Hemoglobin A1c (HbA1c), and Blood Pressure. In the United States, research has been conducted by Elizabeth (2020) discussing changes in metabolic parameters, specifically Body Mass Index, Hemoglobin A1c (HbA1c), and Blood Pressure during and after the stay-at-home orders imposed due to the COVID-19 pandemic showed that stay-at-home orders during the COVID-19 pandemic had a negative impact on individual metabolic parameters, namely an increase in Body Mass Index, HbA1c, and Blood Pressure. This suggests that more frequent visits to primary care should result in better control of HbA1c levels[7].

In terms of Body Mass Index, this study is not in line with previous studies. This study shows that the IMT of

patients from 2019 to 2023 is still stable and does not show a significant decrease. While when compared using attendance and delta IMT, attendance < 40 and ≥ 40 still shows no significant difference. With conditions still tending to be high with the average IMT in 2023 showing 26.2 ± 4.17 in 2023.

For HbA1c results, previous research conducted by Wulandari (2021) found that patients who actively participated in the prolanis program showed better HbA1c levels compared to those who participated less. The results of this study are not in line with previous research, namely HbA1c, a significant difference occurs in the value of the HbA1c parameter in the group of patients with attendance ≥40 months, there is a significant difference with an average value of 7.04% in 2019 and an increase to 7.64% in 2023 with a difference in value of 0.6% and a Z-value of -2.97, while there is no significant difference in the attendance group <40 months. This shows that the increase in HbA1c continues to increase significantly despite following prolanis in the high attendance group. According to the American Diabetes Association (2020), the HbA1c standard is 5.7-6.4% (39-47 mmol/mol) for prediabetes and ≥6.5% (48 mmol/mol) for diabetes. And the diagnosis requires two abnormal test results from the same sample or in two separate samples. HbA1c of prolanis patients at the Mitra Sehati Clinic is still within the above-normal limit of ≥6.5% in its 5-year journey despite routinely attending prolanis ≥40 months[8-9].

For Blood Pressure, after using Chi Square in 2023, there was no significant difference compared to the results that the attendance group <40 months who suffered from hypertension was 4 patients (15.4%) compared to the group of patients with attendance ≥40 months who suffered from hypertension was 10 patients (13.5%). Based on chi-square analysis there was no relationship between attendance group and blood pressure values (p-value>0.05) in the last year of examination (year 2023). This is not in line with the research by Elizabeth (2020) above and the research by Fihaya (2015)[7, 10].

Differences in Lipid Profile (Total Cholesterol, LDL, HDL, and Triglycerides) by Attendance Group

The results of research have been conducted by Mansyur (2021) which examines the effect of the Prolanis program on the heart health of patients with diabetes mellitus, where the Prolanis program has a positive effect on the heart health of patients with diabetes mellitus, it is known that there is a significant decrease in cholesterol, LDL, and triglyceride levels and has a significant increase in HDL levels[11].

In contrast to this study, this study showed that there was no significant difference between Cholesterol, LDL, HDL, and Triglyceride levels between the ≥ 40 months and < 40 months attendance groups. This research is also not in line with research by Sari and Setiawan (2021) also in their journal related to the cholesterol profile of patients with diabetes mellitus before and after participating in the Prolanis program, it is concluded that the prolanis program has a positive impact on the cholesterol profile of patients with diabetes mellitus. Significant changes in cholesterol levels indicate that the interventions carried out in this program are effective in improving patient health[12].

Differences in Renal Function Values (Ureum, Creatinine, and eGFR) by Attendance Group

Suharno's research shows the effectiveness of Prolanis in reducing ureum and creatinine levels in diabetic patients. Suharno, S. (2020) showed that there was a significant decrease in creatinine levels in diabetic patients who participated in the Prolanis program[13].

In contrast to this study, in the ureum parameter, it was found that a significant difference occurred in attendance ≥40 months with an average value in 2019 of 22.47 and increased to an average of 24.13 mg/dL in 2023 with a difference in value of -4.62mg/dL and a Z-value of -2.88, while there was no significant difference in the <40 month attendance group.

The next parameter is the creatinine parameter, it is known that the average value of the creatinine parameter in the <40 month group in 2020 was 0.82 and increased to 0.90mg/dL in 2023 with a difference of 2.51mg/dl, while in the ≥40 month presence group the creatinine value increased from an average of 0.82 in 2020 to 0.90 in 2023 with a difference in value of 0[14].

Significant differences occurred next to the eGFR value parameter in the <40 month attendance group, the average eGFR value in 2020 was 91.50 and decreased to 68.91 in 2023 with a difference of 22.59 and a t value of 0.76. While there was no significant difference in the ≥40 months attendance group, the difference in the average value in 2023 in both groups was 23.59 where the ≥40 months attendance group had a better GFR value compared to the <40 months attendance group. These results are in line with previous research on eGFR by Rahayu (2021) which showed that there was a significant increase in eGFR after patients joined the Prolanis program. The average eGFR increased, which indicates improved kidney function[14].

CONCLUSION

From the results of research on the effect of patient attendance for 5 years in the prolanis program on BMI and clinical parameters of chronic diseases at the Mitra Sehati Clinic, it was found that there were differences in the 5-year averages (2019-2023) in HbA1c, ureum values, creatinine values, and eGFR values. HbA1c values decreased while ureum, creatinine, and eGFR values increased over a period of 5 years.

Then from the results of the study, the parameters of HbA1c and ureum in the group of patients with attendance ≥40 months there was a significant difference in increase compared to attendance <40 months. For creatinine parameter values, it is known that the average creatinine parameter values in the <40 months group and the ≥40 month attendance group have both increased. Significant differences occurred next to the eGFR parameter value in the <40 months attendance group, the eGFR value decreased, while there was no significant difference in the ≥40 months attendance group.

There was a significant effect between attendance for 5 years ≥ 40 months on maintaining eGFR function (eGFR decline) compared to attendance < 40 months. However, it has not been proven to be significant in maintaining HbA1c stability in the ≥ 40 attendance group compared to the < 40 months attendance group. Although there was an increase in ureum and creatinine, attendance ≥ 40 months proved to be able to maintain the stability of ureum and creatinine in normal numbers.

Through this study, it was found that the incidence of hypertension in the <40 months attendance group compared to the ≥40 months attendance group had no influence between the attendance group and blood pressure values (p-value>0.05) in the last year of examination (year 2023).

Of all the data, the most meaningful is the conclusion that following the prolanis program regularly can affect the maintenance of kidney function eGFR (estimated Kidney Filtration Rate) and rarely following the prolanis program is easier to decrease eGFR function which is at risk of complications of kidney disorders in the future.

ADVICE

The results of this study do not describe the overall prolanis activities that have been running at the Mitra Sehati Clinic. Based on Bissonnette's (2018) research, attendance is not the only thing that affects the outcome of the parameters. Further research can be considered as an alternative reference to determine the effectiveness of the prolanis program at the Mitra Sehati Clinic. Other factors besides attendance can be considered in future research in determining the success of the program in Primary Care. However, with research on attendance, it is hoped that the active presence of prolanis participants in the program is expected to improve the quality of life of the participants themselves[15].

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Ethical Approval and Informed Consent

This study was approved by the ethics committee of Padjadjaran University No. 870/UN6.KEP/EC/2024.

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Availability of Data and Material

Data uses secondary data taken from the records of prolanis participants.

Conflicts of Interest

The authors declare that they have no Conflicts of Interest.

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