Healthcare in Low-resource Settings

eISSN: 2281-7824

https://www.pagepressjournals.org/index.php/hls/index

Healthc Low-resour S 2024 [Online ahead of print]

To cite this Article:

Erlina L, Hastuti W. **The impact of the Le-Diabet application on self-efficacy and blood glucose levels in diabetes mellitus patients.** *Healthc Low-resour S* doi: 10.4081/hls.2024.11984

The impact of the Le-Diabet application on self-efficacy and blood glucose levels in diabetes mellitus patients

Lina Erlina,[1] Widi Hastuti[2]

[1]Department of Nursing, Politeknik Kesehatan Kementerian Kesehatan Bandung; [2]Department of Nutrition, Politeknik Kesehatan Kementerian Kesehatan Bandung, Indonesia

Correspondence: Lina Erlina, Department of Nursing, Politeknik Kesehatan Kementerian Kesehatan Bandung, Bandung, Indonesia.
E-mail: linahiar2@gmail.com

Key words: blood glucose, Le-Diabet, self-efficacy.

Contributions: LE, conceptualization, data curation, formal analysis, methodology, validation, visualization, writing - original draft, review and editing; WH, conceptualization, resources, supervision, and writing - review and editing.

Conflict of interest: the authors declare no conflict of interest.

Ethics approval and consent to participate: this research has received ethical approval from the Health Research Ethics Commission, Politeknik Kesehatan Kemenkes Bandung, Indonesia with ethics approval number No. 44/KEPK/EC/IV/2023. During the study, the researchers paid attention to the ethical principles of information to consent, respect for human rights, beneficence and non-maleficence.

Patient consent for publication: written informed consent was obtained for anonymized patient information to be published in this article.

Funding: this research did not receive external funding.

Availability of data and materials: all data generated or analyzed during this study are included in this published article.

Abstract

Le-Diabet is an Android mobile application developed for diabetes management whose effectiveness has remained unknown. This research aimed to investigate its impact on self-efficacy and blood glucose levels in patients with diabetes. Employing a quasi-experimental approach, the study utilized a pretest and posttest control group design. The sample included 28 respondents in the control group and 34 in the intervention group, selected through purposive sampling based on criteria such as diagnosed diabetes, smartphone usage, and 6 weeks of using the Le-Diabet application. Self-efficacy was measured using the Diabetes Management Self-Efficacy Scale, while blood glucose levels were monitored with a glucometer. Data analysis involved paired and unpaired *t*-tests. The results revealed a significant increase in self-efficacy scores by 3.1 points [p=0.000, 95% confidence interval (CI) = -6.006 to -1.876] in the intervention group, whereas the control group experienced a decrease of 1.9 points. Both groups exhibited an increase in blood glucose levels, with a significant rise of 35.6 mg/dL (p=0.035, 95% CI = -68.578 to -2.636) in the control group and a non-significant increase of 3.59 mg/dL (p=0.076, 95% CI = -22.759 to 15.582) in the intervention group. The research concludes that the use of the Le-Diabet application enhances self-efficacy and maintains blood glucose level stability; however, it has not shown

an impact on metabolic syndrome indicators in diabetic patients. Further research is needed, utilizing a larger and more diverse sample from various age groups and extending the duration of the study to evaluate the long-term impact of the applied intervention.

Introduction

The prevalence of diabetes mellitus in Indonesia is estimated to continue to increase both at the national and global levels.[1] The World Health Organization estimates that by 2030 the number of diabetes sufferers in Indonesia will increase threefold since 2000. In 2000, there were around 8.4 million diabetes sufferers, while in 2030, the estimate will reach 21.3 million people.[2] This prediction shows a significant upward trend. The results of Basic Health Research in 2018 show that the prevalence of diabetes in Indonesia reached 8.5%.[3,4] This shows that more than 8% of Indonesia's population suffers from diabetes. This data highlights the importance of efforts to prevent and manage diabetes in Indonesia.

The Indonesian Endocrinology Association states that there are five pillars of diabetes management, namely education, diet, physical activity, medication, and blood sugar monitoring.[2] The five pillars of diabetes management cannot be separated because they are continuous with one another. Of the five pillars, education is the key to the success of the other four pillars. Insufficient education will result in a lack of knowledge, thereby triggering a high prevalence of diabetes and high complications due to diabetes itself.[5,6]

Diabetes is a chronic disease that needs to be controlled throughout life, so the patient's role in managing the disease is very important.[7-9] The patients' ability to control and reduce the impact of the disease they suffer from affects the process and results of diabetes management.[10-12] This ability is known as diabetes self-care management, which can help patients control their blood sugar, thereby reducing the risk of complications.[13] Self-care management can prevent morbidity, long-term complications and even death.[14]

Many ways can be used to provide education to patients and families regarding diabetes and self-care management, namely by utilizing digital information technology, which is currently continuing to develop.[15-17] There are 90.54% of households in Indonesia that use cellular telephones.[18,19] This allows cellular phones, which are now better known as smartphones, to be used as an educational medium for diabetes sufferers.[20] There are several smartphone software that can be used as a health education medium, such as websites and mobile applications.

Several studies on mobile applications have been carried out. The research results stated that the e-diary mobile application was effective for use as an educational medium in increasing diabetes sufferers' diet compliance. The results of the study showed that there was an increase in the average diet compliance of diabetes patients by 0.80. The results of the Wilcoxon rank test analysis obtained a p-value of 0.006. This shows that implementing the mobile e-diary application is meaningful and significantly effective in increasing dietary compliance in diabetes mellitus patients.[20] This is in line with research results that state that education based on the mobile application "Teman Diabetes" has been proven to be effective and has a clinically significant positive effect on the knowledge and attitudes of diabetes sufferers.[21]

The Le-Diabet application, the latest Android-based innovation developed by researchers, stands out as distinctive software with its unique features. Integrated with a comprehensive diabetes management concept, Le-Diabet comprises five main pillars: education, dietary patterns, physical activity, self-blood glucose monitoring, and diabetes therapy. The education provided by Le-Diabet includes up-to-date information on diabetes and its management, directly linked to the website of the Ministry of Health of the Republic of Indonesia. Designed with attractive and user-friendly features, the application facilitates ease of operation for patients. Users can input their current data, and Le-Diabet provides relevant recommendations, covering aspects such as dietary needs with sample menus, physical activity, healthcare management, and required therapies.[22]

Le-Diabet also offers statistical features to monitor trends in examination results, including blood glucose levels, glycated hemoglobin (HbA1C), blood pressure, cholesterol, and other examinations. With its alarm features, Le-Diabet assists users in remembering medication, appointment times, and other necessary tasks. With Le-Diabet, users can independently monitor their conditions, receive recommendations tailored to their health status, and acquire in-depth knowledge about diabetes.[22]

Education through Le-Diabet is expected to enhance the self-efficacy of patients, aiding in achieving optimal glucose control. However, the effectiveness of implementing Le-Diabet in diabetes patients still requires further investigation. Therefore, this research aimed to evaluate the extent to which Le-Diabet contributes to the improvement of self-efficacy and the management of blood glucose levels in diabetes patients.

Materials and Methods

Research design

This study employed a quasi-experimental method with a pretest and posttest control group design approach. In the pretest phase, before the intervention was implemented, both groups, namely the intervention group and the control group, underwent measurements of relevant variables to assess their initial conditions. Subsequently, the intervention group received the intervention, while the control group did not undergo any intervention. The posttest phase was conducted on both groups after the intervention was completed to evaluate the impact of changes that may occur due to the intervention.

Study participants

The total sample was 62 respondents, comprising 28 patients in the control group and 34 diabetes patients in the intervention group. Sampling was taken using a purposive sampling technique with inclusion criteria: patients with a medical diagnosis of diabetes mellitus, owning and using a smartphone either alone or with their family, and willing to use the Le-Diabet application for 6 weeks.

Variable, instrument, and data collection

The measured variables involved self-efficacy and blood glucose levels before and after intervention in both the control and intervention groups. Additionally, other variables serving as indicators of metabolic syndrome are also measured, including systolic and diastolic blood pressure, blood cholesterol, uric acid, and the respondent's body weight. All measurements were taken twice, both before and after the 6-week intervention period, in both the control and intervention groups.

Self-efficacy was assessed using the Indonesian version of the Diabetes Management Self-Efficacy Scale, comprising 20 items. The instrument employs a 4-point Likert scale: very incapable = 1, incapable = 2, capable = 3, and very capable = 4. Self-efficacy scores range from 20 to 60. The instrument's validity was tested on 30 respondents, yielding a Cronbach's α value of 0.939 [95% confidence interval (CI)].[23]

Blood glucose and metabolic syndrome indicator measurements are conducted using peripheral blood samples after patients have fasted for a minimum of 10 hours and only consumed water before the examination. The examination tools used have consistent brands and types for all respondents, and the results are presented in mg/dL. Blood pressure is measured using an electric sphygmomanometer in mmHg, while respondents' body weight is measured using an electric scale in kilograms (Kg). All instruments have undergone a calibration process, including instrument calibration, results calibration, and battery calibration, performed at the Laboratory of Health Polytechnic of the Ministry of Health in Bandung, Indonesia.

Data analysis

Univariate analysis was used to analyze respondent demographics, including age, gender, occupation, and nutritional status, which were presented in the frequency distribution table. Bivariate analysis was used to determine the effect of the intervention and the differences between the control and intervention groups. Before carrying out bivariate analysis, a data normality test was carried out, which resulted in normally distributed data. On this basis, the analysis was carried out using the paired and unpaired *t*-test.

Ethical clearance

This research received ethical clearance from the Health Research Ethics Committee of Politeknik Kesehatan Kemenkes Bandung, Indonesia, with approval number No. 44/KEPK/EC/IV/2023. During the research, the researchers paid attention to the ethical principles of information to consent, respect for human rights, beneficence and non-maleficence.

Results

The characteristics of respondents based on age, gender, occupation, and nutritional status are presented in Table 1. The results from Table 1 indicated that the majority of respondents in both groups were in the late-elderly age category (67.6%). Most respondents were female (70.3%), the majority of whom were not employed (67.6%), and their nutritional status predominantly fell into the overweight and obese categories in both groups (53%).

The effectiveness of the Le-Diabet application was measured against the respondents' self-efficacy variables and blood glucose levels. Metabolic syndrome indicators were also measured in this study, such as blood pressure, blood cholesterol, uric acid, and the respondent's body weight, which were also analyzed considering that these factors are closely related to changes in the respondent's blood glucose. All measurements were carried out twice with an interval of 6 weeks in both the control and intervention groups. The average measurement results pre- and post-intervention in the two groups can be seen in Table 2.

Table 2 indicated that at pre-intervention, it was observed that among the seven variables investigated, only two exhibited a significant mean difference between the two groups: systolic blood pressure (p=0.015, 95% CI=3.030-27.129) and diastolic blood pressure (p=0.048, 95% CI=0.067-13.685). The remaining variables (self-efficacy, blood glucose, total cholesterol, respondents' uric acid, and body weight) showed no significant mean difference between the two groups. However, this pattern changed in the post-intervention data, which revealed alterations in the mean values of all variables in both groups. Nevertheless, only three variables demonstrated significant differences between the two groups: self-efficacy (p=0.000, 95% CI= -8.179 - -2.799), blood glucose (p=0.001, 95% CI=23.785-90.497), and systolic blood pressure (p=0.028, 95% CI=0.919-15.509), while the other variables showed no significant mean differences (p>0.05).

The effectiveness of using the Le-Diabet application on diabetes management indicators, namely self-efficacy, blood glucose, blood pressure, cholesterol, uric acid, and respondents' body weight, can be seen in Table 3, which depicts the research findings, recording the average changes before and after the intervention in both groups for all variables. In the control group, there was a decrease in average self-efficacy by 1.9 post-intervention. Meanwhile, the intervention group exhibited a significant increase in average self-efficacy by 3.1 after the intervention compared to before (p=0.000, 95% CI= -6.006 - -1.876). The average blood glucose increased in both groups after the intervention. However, the increase in average blood glucose in the control group was significantly higher than in the intervention group. The control group experienced a significant increase in blood glucose by 35.6 mg/dL (p=0.035, 95% CI= -68.578 - -2.636). Meanwhile, the intervention group showed a stable increase in the average blood glucose, only by 3.59 mg/dL, and the statistical test indicated a non-significant increase (p=0.076, 95% CI= -22.759-15.582). Table 3 also shows changes in metabolic syndrome indicators, such as systolic and diastolic blood pressure, which decreased in both groups after the intervention. Other variables, like cholesterol, uric acid, and body weight, showed changes in averages in both groups, but these changes were not significant (p>0.05).

Discussion

Self-care management using digital information technology is currently in development. Technological advances support the acceleration of increasing knowledge and disseminating information, especially regarding diabetes mellitus. Cellular telephones, which nowadays have become a necessity in daily activities, can be used as an educational medium for diabetes patients.[20] The results of the study showed that there was a significant increase in mean self-efficacy of 3.1 in the intervention group, whereas, in the control group, there was a decrease in self-efficacy. The research results show that using the Le-Diabet application can significantly increase respondents' self-efficacy. The results of this study are in line with Marbun *et al*. (2012), who state that smartphone applications can influence self-efficacy in diabetes patients so that applications can facilitate the process of self-management and treatment adherence and increase blood glucose control in diabetes patients.[23] Self-efficacy has a positive relationship with the self-care of diabetes patients, and self-care is needed to maximize diabetes self-management.[13] Self-efficacy is a person's belief in their ability to organize and carry out actions that support their health, which is very necessary for diabetes patients to increase their independence in managing their disease.[24]

Blood glucose examination is the main indicator in diabetes management. Blood glucose levels are important in monitoring the success of diabetes management. The results of the study showed that in both groups, the mean blood glucose of respondents was above normal both pre- and post-intervention. Post-intervention blood glucose showed results that did not match expectations, in which the mean blood glucose level increased in both groups. In the control group, there was a significant mean increase of 35.6 mg/dL, and in the intervention group, blood glucose was relatively stable; there was a slight increase of 3.59 mg/dL but not significant. This shows that the Le-Diabet application can be used as a diabetes education medium to facilitate independent diabetes management so that respondents' blood glucose control becomes better. The research results are in line with other research, which states that Android-based applications increase knowledge about diabetes self-management so that they can help diabetes patients adhere to their therapy so that glycemic control becomes better.[25]

Other metabolic syndrome indicators, such as blood pressure, total blood cholesterol, uric acid, and body weight, demonstrated non-significant changes. Effective diabetes control is not only reflected in the stability of blood glucose levels but also in maintaining blood pressure, lipid profile, and body weight within the normal range according to predefined targets.[2] Although the research results indicate changes in intervention outcomes in both groups, these changes are not statistically significant. This finding suggests that the use of the Le-Diabet application has not yet yielded a significant impact on regulating metabolic syndrome indicators. Long-term research is necessary to assess the intervention's impact on metabolic syndrome as a long-term outcome.

The respondents in this study were all elderly patients, most of whom were women; almost all of them did not work, and their nutritional status fell into the overweight and obese categories. Apart from that, both respondents also had a mean of systolic and diastolic blood pressure that was higher than normal, a high mean of cholesterol, and a relatively high mean of uric acid. This data shows that respondents have high-risk factors, so efforts are needed to manage glycemic and metabolic control to avoid diabetes complications. Therefore, it is important to increase knowledge and attitudes regarding diabetes, adopt a healthy lifestyle and balanced diet, exercise regularly, and avoid smoking to reduce the development of diabetes.[2,26]

This study has several limitations. The limited sample size, along with a focus on the elderly in sample selection, inhibits the generalization of results to a broader population. Confounding variables such as lifestyle and adherence to medication need special attention to ensure more accurate results. Additionally, the variability in the sample's ability to use the Le-Diabet is also a crucial factor that needs to be considered. Time constraints in the study also serve as a limiting factor in evaluating the long-term impact of application usage. Therefore, this study emphasizes the importance of carefully addressing these factors to ensure more valid and applicable results.

Conclusions

The study concludes that utilizing the Le-Diabet application in diabetic patients can enhance self-efficacy and help maintain stable blood glucose levels. However, the intervention did not significantly impact metabolic syndrome indicators. Further research over an extended period is recommended to fully understand the intervention's effects on these indicators. Improving the research quality could involve using a larger and more diverse sample across different age groups. Additionally, factors such as patients' lifestyle and medication adherence should be considered in future research designs. Proficiency in using the Le-Diabet application should also be taken into account, as it may influence intervention outcomes. Overall, future research endeavors could offer a more comprehensive understanding of the long-term effects of this intervention.

References

1. Mboi N, Syailendrawati R, Ostroff SM, et al. The state of health in Indonesia's provinces, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet Glob Health 2022;10:e1632-45.
2. Soelistijo SA. Pedoman Pengelolaan dan pencegahan diabetes melitus tipe 2 dewasa di Indonesia. Available from: https://pbperkeni.or.id/wp-content/uploads/2021/06/Pedoman-Pengelolaan-DM-Tipe-2-Dewasa-di-Indonesia-eBook-PDF.pdf. [Material in Indonesian].
3. Kemenkes RI. Laporan nasional riset kesehatan dasar. Available from: https://repository.badankebijakan.kemkes.go.id/id/eprint/3514/1/Laporan%20Riskesdas%202018%20Nasional.pdf. Kementeri Kesehat RI. Published online 2018:1-582.
4. National Institute for Health Research and Development. Riset kesehatan dasar. 2013.
5. Hikmatul N, Harmiadillah S, Puspita T. Lima pilar diabetes mellitus. Rismedia Pustaka Indonesia. 2022.
6. Arifin B, Probandari A, Purba AKR, et al. 'Diabetes is a gift from god' a qualitative study coping with diabetes distress by Indonesian outpatients. Qual Life Res 2020;29:109-25.
7. Widyaningsih V, Febrinasari RP, Sari V, et al. Potential and challenges for an integrated management of tuberculosis, diabetes mellitus, and hypertension: a scoping review protocol. PLoS One 2022;17:e0271323.
8. Kusnanto K, Pradipta RO, Arifin H, et al. What I felt as a diabetes fatigue survivor: a phenomenology study. J Diabetes Metab Disord 2022;21:1753-62.
9. Joeliantina A, Norontoko DA, Adinata AA, et al. Self-care of chronic illness prevents the risk of diabetic foot ulcers in patients with diabetes: a cross-sectional study. J Ners 2024;19:39-46.
10. Handayanu DS, Yudianto K, Kurniawan T. Perilaku self-management pasien diabetes melitus (DM) Self-Management Behaviour of Patient with Diabetes Mellitus (DM). Padjadjaran Nurs J 2013;1. doi:10.24198/jkp.v1i1.49.
11. Setiyorini E, Qomaruddin MB, Wibisono S, et al. Complementary and alternative medicine for glycemic control of diabetes mellitus: a systematic review. J Public Health Res 2022;11: 22799036221106582.
12. Estuningsih Y, Rochmah TN, Andriani M, Mahmudiono T. Effect of self-regulated learning for improving dietary management and quality of life in patients with type-2 diabetes mellitus at Dr. Ramelan Naval Hospital, Surabaya, Indonesia. Kesmas 2019;14:51-7.
13. Sabil FA, Kadar KS, Sjattar EL. Faktor – faktor pendukung self care management diabetes mellitus tipe 2: a literature review. J Keperawatan 2019;10:41-7. [Article in Indonesian].
14. Novianti D, Indriyawati N, Arif S. Efektivitas diabetes self management education & community

based interactive approach terhadap self care penderita diabetes mellitus. JNJ 2019;3:1-10.
15. Viandarisa N, Priyono D, Tanjungpura M, et al. Penggunaan mobile health berbasis smartphone untuk meningkatkan self management pada pasien diabetes melitus tipe 2: literature review. J Untan 2022;7:1-18.
16. Zainuddin, Abdullah AZ, Jafar N, et al. Health literacy brisk walking exercise on clinical outcomes of blood sugar in patients with type 2 diabetes mellitus in Indonesia. Pharmacogn J 2023;15:433-8.
17. Sukartini T, Nursalam N, Pradipta RO, Ubudiyah M. Potential methods to improve self-management in those with type 2 diabetes: a narrative review. Int J Endocrinol Metab 2023;21:e119698.
18. Badan Pusat Statistik. Statistik Telekomunikasi Indonesia 2021. Available from: https://www.bps.go.id/id/publication/2022/09/07/bcc820e694c537ed3ec131b9/statistik-telekomunikasi-indonesia-2021.html.
19. Ratnasari I, Ngadiarti I, Ahmad LF. Application of diabetes self-management education and support in outpatients with type II DM. Media Gizi Indones 2022;17:43-50.
20. Luawo HP, Sjattar EL, Bahar B, et al. Aplikasi e-diary DM sebagai alat monitoring manajemen selfcare pengelolaan diet pasien DM. Nurscope 2019;5:32-8.
21. Hasanah N, Ikawati Z, Zainai ZA. The effectiveness of smartphone application-based education teman diabetes on clinical outcomes of type-2 diabetes mellitus patients. Res J Pharm Technol 2021:14:3625-30.
22. Erlina L. Desain aplikasi Le-Diabet. Poltekkes Kemenkes Bandung. 2023.
23. Marbun AS, Siregar R, Harefa K, et al. Pengaruh diabetes self management education (dsme) berbasis aplikasi whatsapp terhadap self efficacy pada pasien dm tipe 2 di puskesmas hamparan perak. J Mutiara Ners 2021;4.
24. Marleni L, Mulkanaziman A. Hubungan efikasi diri dengan kejadian komplikasi diabetes mellitus tipe 2. J Keperawatan Sriwij 2020;7:59-65.
25. Oktovin O, Unja EE, Rachman A. Systematic review: penggunaan smartphone untuk program management life style pasien diabetes melitus tipe 2. JKSI 2018;3:1-10.
26. Association American Diabetes. Guidelines ADA J Clin Appl Res Educ Diabetes Care 2022;45.

Table 1. Characteristics of respondents.

Variables	Control group		Intervention group	
	n=28	%	n=34	%
Age				
Early old age	6	16.6	9	24.3
Late old age	22	59.5	25	67.6
Gender				

Man	5	13.5	8	21.6
Woman	23	62.2	26	70.3
Work				
Work	3	10.7	9	24.3
Does not work	25	89.3	25	67.6
Nutritional status				
Normal	12	42.8	16	47
Overweight and obese	16	57.1	18	53

Table 2. Description of the mean self-efficacy, blood glucose, blood pressure, cholesterol, uric acid, and body weight of respondents in the control and intervention groups pre- and post-intervention

Variable	Intervention	Control group	Intervention group	p-value	95% CI	
					Lower	Upper
Self-efficacy	Pre	45.286	44.941	0.871	-3.902	4.591
	Post	43.393	48.882	0.000*	-8.179	-2.799
Blood glucose	Pre	157.857	142.647	0.194	-7.999	38.420
	Post	193.464	136.324	0.001*	23.785	90.497
Systolic blood pressure	Pre	151.786	136.706	0.015*	3.030	27.129
	Post	138.714	130,500	0.028*	0.919	15.509
Diastolic blood pressure	Pre	92.464	85.588	0.048*	0.067	13.685
	Post	83.714	82.353	0.566	-3.352	6.074
Total cholesterol	Pre	213.714	201.882	0.228	-7.599	31.263
	Post	222.250	208.147	0.091	-2.325	30.531
Gout	Pre	5.879	6.359	0.309	-1.417	0.456
	Post	5.689	5.927	0.484	-0.911	0.436
Weight	Pre	59.346	61.566	0.471	-8.344	3.904
	Post	58.705	61.146	0.435	-8.651	3.770

CI, confidence interval; *significant.

Table 3. Effects of using the Le-Diabet application.

Variable		Mean	Standard deviation	p	95% CI		n
					Lower	Upper	
Self-Efficacy							
Control group	Pre	45.286	9.610	0.220	-1.203	4.988	28
	Post	43.393	4.954				
Intervention group	Pre	44.941	6.237	0.000*	-6.006	-1.876	34

	Post	48.882	5.515				
Blood glucose							
Control group	Pre	157.857	52.175	0.035*	-68.578	-2.636	28
	Post	193.464	81.518				
Intervention group	Pre	142.647	34.811	0.706	-22.759	15.582	34
	Post	146.235	54.756				
Systolic blood pressure							
Control group	Pre	151.786	23.776	0.008*	3.783	22.359	28
	Post	138.714	16.608				
Intervention group	Pre	136.706	23.464	0.142	-2.191	14.603	34
	Post	130,500	12.066				
Diastolic blood pressure							
Control group	Pre	92.464	14.393	0.002*	3.474	14.026	28
	Post	83.714	10.359				
Intervention group	Pre	85.588	12.409	0.100	-0.656	7.126	34
	Post	82.353	8.198				
Total cholesterol							
Control group	Pre	213.714	37.507	0.328	-26.132	9.060	28
	Post	222.250	33.861				
Intervention group	Pre	201.882	38.514	0.247	-17.082	4.553	34
	Post	208.147	30.741				
Gout							
Control group	Pre	5.879	1.864	0.504	-0.385	0.763	28
	Post	5.689	1.409				
Intervention group	Pre	6.359	1.809	0.133	-0.138	1.003	34
	Post	5.927	1.242				
Weight							
Control group	Pre	59.346	10.307	0.174	-0.302	1.584	28
	Post	58.705	11.095				
Intervention group	Pre	61.566	13.220	0.587	-1.138	1.979	34
	Post	61.146	12.978				

CI, confidence interval; *significant.