Journal of the
**ASEAN Federation of
Endocrine Societies**

The Impact of the Filipino Plate Method versus Standard Nutrition Education on Food Group Proportions and 2-hour Postprandial Blood Glucose for Type 2 Diabetes

Richultz Montevirgen,[1] Kristine Bea Mendoza,[2] Lizette Kristine Lopez[1]

[1]*Section of Endocrinology, Diabetes and Metabolism, Department of Medicine, The Medical City, Pasig City, Philippines*
[2]*Nutrition Management Services, The Medical City, Pasig City, Philippines*

Abstract

Objectives. To compare the efficacy of the Filipino plate method against standard nutrition education in the selection of food group proportions and in reducing 2-hour postprandial blood glucose levels (2h-PPG) among patients with type 2 diabetes.

Methodology. This randomized, open-label trial assigned 148 subjects with type 2 diabetes to receive nutrition education using either the Filipino plate method or standard nutrition education, as recommended by the American Diabetes Association (ADA). The subjects were given meals before and three days after the intervention, at which time the contents of their plate were scored based on food group proportions. After the meal, 2h-PPG levels were obtained. Pre- and post-intervention plate scores and 2h-PPG were compared in both groups.

Results. Plate scores were significantly increased from pre to post-teaching for both groups (*p value* <0.001). There was no statistically significant difference in post-teaching scores between the two modes of nutrition education (Filipino plate method median score 8/9 vs standard nutrition education 7/9, *p*=0.018). The 2h-PPG results decreased significantly from baseline to post-teaching for both groups (*p*=0.008). There was no significant difference in the reduction in 2h-PPG between the two groups (*p*=.741).

Conclusion. The Filipino plate method was comparable to standard nutrition education in improving food group choices and proportions as well as 2h-PPG in patients with type 2 diabetes.

Key words: diabetes, nutrition, post prandial glucose

INTRODUCTION

According to the World Health Organization (WHO), diabetes mellitus is one of the non-communicable diseases which is increasing in prevalence.[1] Various studies have demonstrated that uncontrolled hyperglycemia increases the risk for microvascular and macrovascular complications.[2-5] Therefore, optimal diabetes management to achieve glycemic control is important in delaying or preventing complications.

Medical nutrition therapy (MNT) is well-recognized as a cornerstone of diabetes management. Per the American Diabetes Association (ADA) guidelines, all patients with diabetes should have a teaching encounter for individualized medical nutrition therapy, preferably with a registered dietitian. These encounters should last from 45 to 90 minutes and should include the determination of the individual's goal macronutrient content.[6] By the description, the recommended standard nutrition education sessions are time-consuming and require the specialized knowledge of a dietitian or a diabetes educator, which may not be available in most settings.

To simplify nutrition education, the plate method was developed. As early as 1987, the plate method was already used by various countries in Europe to teach patients with diabetes, because it was straightforward and easy to teach, minimizing any language barrier between the patient and the educator.[7] In the plate method, a dinner plate serves as a pie chart to show proportions of the plate that should be covered by various food groups. Portions of food and appropriate food choices are depicted for meals and snacks in assorted forms of the model. This model was presented as a simple alternative to the traditional exchange-based method for teaching meal planning.[7] In acknowledgement of the usefulness and possible benefits of the plate method and the continuing gap in providing the need for nutrition education for patients with diabetes, the University of Idaho developed their own plate method to be used specifically for educating patients with diabetes. This was termed "The Healthy Diabetes Plate" or the Idaho Plate Method (IPM).[8]

In 2014, the Department of Science and Technology- Food and Nutrition Research Institute (DOST-FNRI) developed the Filipino plate method to address the

Corresponding author: Richultz C. Montevirgen, MD
Fellow, Section of Endocrinology, Diabetes and Metabolism,
Department of Medicine, The Medical City
Ortigas Avenue, Pasig City, Philippines
Tel. No.: (632) 898-81000
E-mail: chokmd29@gmail.com
ORCiD: https://orcid.org/0000-0003-2699-8238

growing prevalence of obesity in the Philippines.[9] It is an easy-to-understand, visual tool for educating patients on healthful eating habits, requiring less time and less specialized skills and knowledge to teach. However, in the local setting, this tool has not been incorporated in protocols for managing persons with diabetes. Nutrition education is provided at the discretion of each physician giving the advice. Unfortunately, such advice may not be extensive, as nutrition education is often time-consuming. Consequently, patients with diabetes often have poor knowledge of a healthy diet and nutrition.

This study aims to evaluate the efficacy of the Filipino plate method against standard nutrition education in the selection of food group proportions and in reducing 2-hour postprandial blood glucose levels (2h-PPG) among patients with type 2 diabetes. If proven efficacious, this simpler plate method may be used to make nutrition education easier to teach and accessible to more patients with diabetes.

METHODOLOGY

This is a prospective randomized controlled trial which used pre- and post-intervention assessments across time. We recruited participants with diabetes mellitus type 2 who were either a member of the Diabetes Club or were being treated in a community health center in Obando, Bulacan, Philippines. By word-of-mouth through the Diabetes Club and the health workers in the health center, those interested in participating were invited to come in during the specific date in which the study was held and thus recruited by convenience sampling. We included patients if they were aged 19 years old and above and spoke either English or Filipino. We excluded patients who were pregnant, those who had formal diabetes and nutrition education via individual consultation with a registered nutritionist-dietitian, those who were already actively using any plate method for planning meals, and those who were fully dependent on others to plan their meals. Randomization was done via a coin toss, with one group assigned to the Filipino plate method, while the other was assigned to the standard nutrition education for diabetes.

Sample size
A minimum of 124 subjects are required for this study or 62 per arm assuming a mean ± SD change in HbA1c from baseline to 6 months equal to -1.13 ± -1.196 and -0.25 ± -1.847 in the modified plate method and control groups, respectively. The values were based on the RCT study of Bowen, et al, at 80% power, 5% alpha level of significance, and accounted for an anticipated 20% dropout rate.

Formulation of test products
The primary outcomes were knowledge of appropriate meal portions and compliance with the food proportions on the plate (Figure 1). This was measured via meal planning sheets obtained from the participants, as well as plate portions of the actual meals, scored simultaneously by two registered nutritionist-dietitians. Figure 2 shows an example of the meal planning sheet and plate portion sheet.

The meal planning sheet is a large blank piece of paper on which the participants drew the plates and estimated portions of the different food groups that they usually eat. The plate portion sheet was pre-filled with the proper food groups and portions. The large circle symbolizing the plate should ideally be exactly 9 inches.

The meal planning sheets with the participants' drawings were scored from 0 to 10 points. The completeness of food groups and appropriate portions were taken into consideration. One point each was given if there was water, a carbohydrate source, a protein source, fruits, and vegetables on the sheet. The presence of all of these garnered a total of 5 points for completeness of food groups. The correct portion size per food group also corresponded to one point each, for a perfect score of 10.

Participants were provided with meals in a buffet style, from which they were freely allowed to take food. Two nutritionist-dietitians then scored the contents of the plates of the respondents from 0 to 9, using a plate portion sheet as a guide. One point each was given if the participant took proper plate portions of carbohydrates, protein, fruits, and vegetables, for a total of 4 points. We also
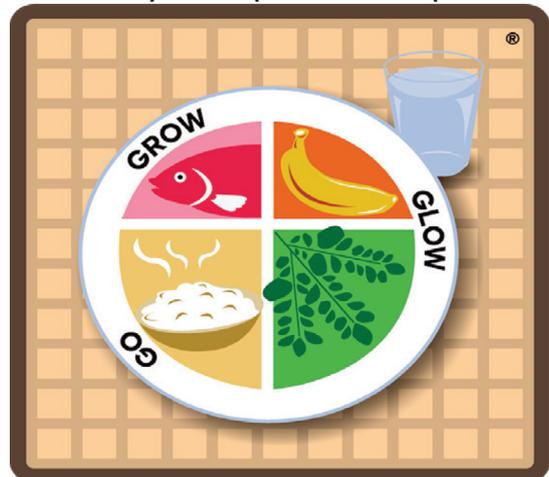
Figure 1. Filipino Plate Method (Adopted from the FNRI-DOST).[9]
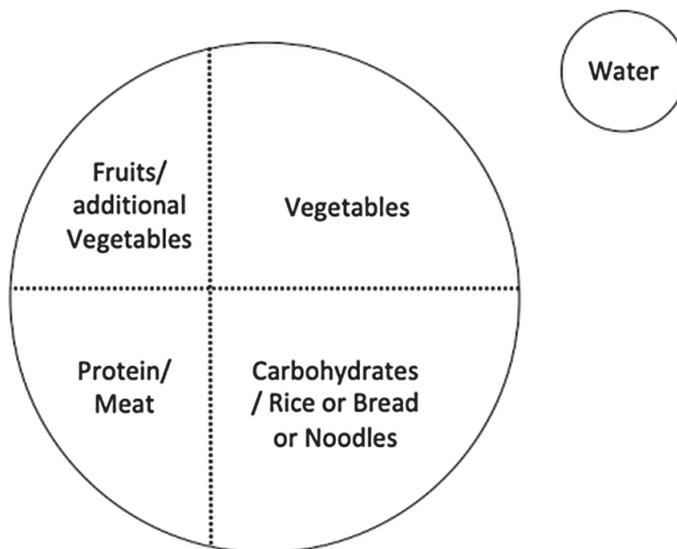
Figure 2. Sample meal planning sheet.

provided at least two options per food group, with one option being healthier (less fatty or less starchy) than the other. An additional point per food group was given if the healthier option was chosen. Plates of various sizes were also provided. If the correct plate size of no larger than 9 inches was chosen, another point was given. The perfect plate score was 9 points.

Another outcome measured was the 2-hour plasma postprandial blood glucose levels (2h-PPG) of the participants, after their meals at days 1 and 3. The blood drawn was sent to the laboratory for processing.

Determining baseline practices

After recruitment, we tested participants for their food group choices and portions using the blank meal planning sheets (Day 1). Participants drew the usual size of their plates and the food portions of their meals on the plate. They also drew a representation of the fluids they usually drank and any food that they may consume outside of their plate (fruits, dessert, etc.). The sheets were then submitted to a nutritionist-dietitian who scored the sheets. The scores were recorded in a database under assigned numerical codes.

Plate portion scoring sheet and 2h-PPG

Participants were given 100 pesos as dummy money to buy a meal, to simulate the limited budget for food in the real-world setting. They were brought to the cafeteria area, which offered different options from all the major food groups. Plates of different sizes were provided at the start of the food line, where a menu with the "prices" of the different dishes was posted. The participants were invited to freely choose the food and drink given the limited budget. After making their choices and placing the food and beverages on their plate and tray, they lined up at the cashier to "pay" for their food. Two nutritionist-dietitians stood by the cashier behind a counter to independently score each participant's plate using a plate portion scoring sheet. The plate portion scoring sheet were labeled with the participants' codes, as determined from their code tags. The average of the scores of both dietitians for the plate portion scoring sheet of each participant were then recorded in the database.

Participants were also asked to consume their chosen meals within 30 minutes. Two hours from the time of the first bite, venous blood was drawn to check for 2h-PPG, the results of which were recorded.

Nutrition education

After the above procedures, two nutritionist-dietitians performed group nutrition counseling simultaneously. One nutritionist-dietitian taught the Filipino plate method to one group, while the other gave standard nutrition education to the second group. Both groups received a standard 1,900 kcal/day nutrition education,[6] with differing teaching materials as appropriate for each methodology.

Nutrition education using the Filipino plate method was completed within 15 minutes, while the standard nutrition education for diabetes took approximately 60 minutes to teach. The standard nutrition education discussed all the nutrition recommendations of the ADA, such as determining individual macronutrient content,

the intake of complex rather than simple carbohydrates, the use of nonnutritive or hypocaloric sweeteners, the intake of mono- or polyunsaturated fatty acids, limiting saturated fatty acids to less than 10% of calories, and advice on micronutrient, sodium, and alcohol intake. On the other hand, nutrition education using the Filipino plate method emphasized eating the food groups in their proper portions, as visualized in the tool. All participants were also advised against drinking sweetened drinks.

Post-education testing

Participants were asked to return after 3 days. The procedures described above under "Plate portion scoring sheet and 2h-PPG" were repeated at day 3. The participants were asked to draw on the meal planning sheets, then given a meal with the contents of their plates being surreptitiously scored by two nutritionist-dietitians. Blood was drawn for 2h-PPG after the meals. Figure 3 shows the overview of the participant's flow during the whole study.

Statistical analysis

Descriptive statistics were used to summarize the characteristics of the participants. Frequency and proportion were used for categorical variables such as sex, BMI class, education, and annual income. The Shapiro-Wilk test was used to check for normality of continuous variables such as age, duration of diabetes, plate scores, meal planning scores, and 2h-PPG. Medians and ranges were then used to describe non-normally distributed continuous variables. The Mann-Whitney U test was used to compare medians of the Filipino plate method group and Standard nutrition education group. Chi-square test was used to compare the frequency of the two groups. For variables that did not meet the assumptions for chi-square test, we used Fisher's exact test instead. All valid data were included in the analysis. No imputation was done on any variables. Null hypothesis was rejected at 0.05 α-level of significance. STATA 15.0 was used for data analysis.

Ethical approval

The study was approved by the Institutional Review Board of The Medical City, Philippines, in partnership with the Clinical and Translational Research Institute (CTRI) of the same institution with the registration number GCSMED2019-044. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee, and with the 1964 Helsinki declaration, and its later amendments or comparable ethical standards. Informed consent was obtained from all participants included in the study.

RESULTS

A total of 197 participants were recruited. Of these, 148 participants were included for the study endpoint (Figure 4), with 75 (50.68%) being randomized to the Filipino plate method group and 73 (49.32%) to the standard nutrition education group.

The median age of the participants was 62 years (range 22 to 86 years). The participants were mostly female (72.97%). Half of the participants were within the normal BMI range. Approximately four in ten participants had completed only elementary school level. 87.16% of the
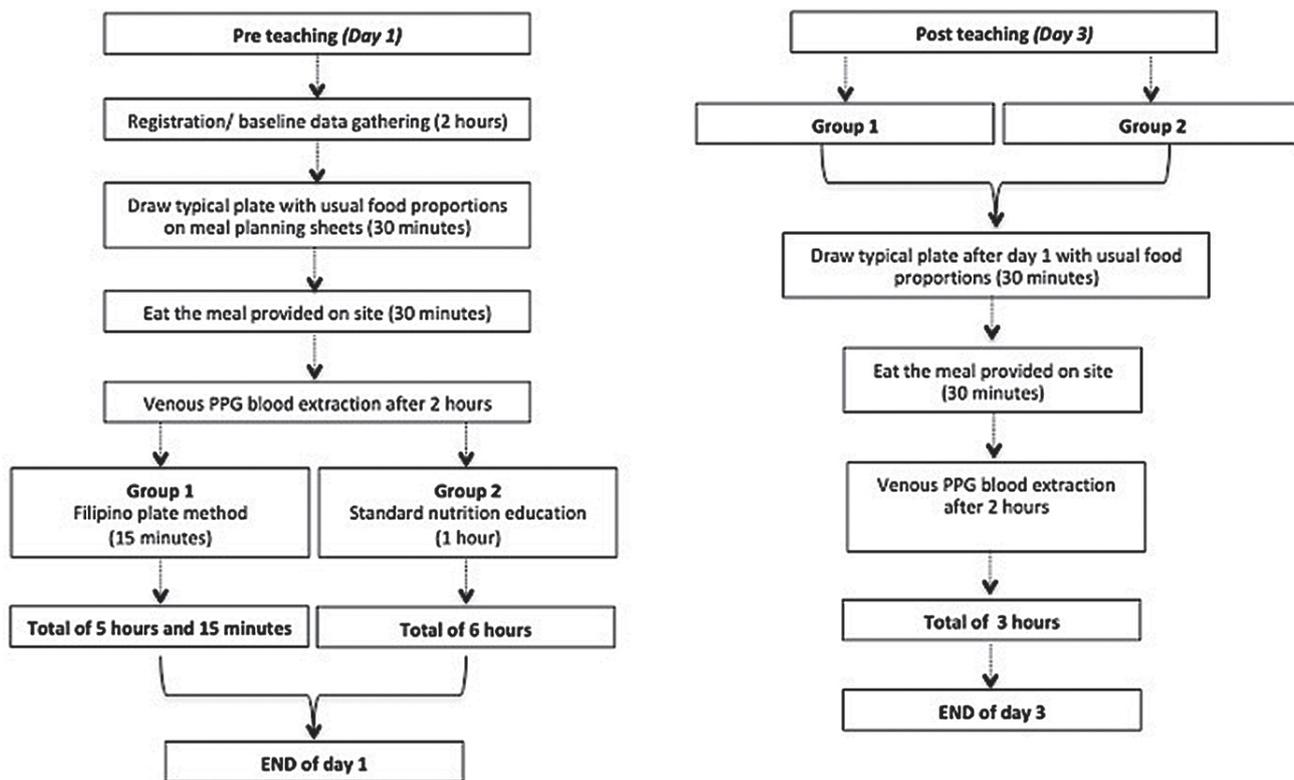
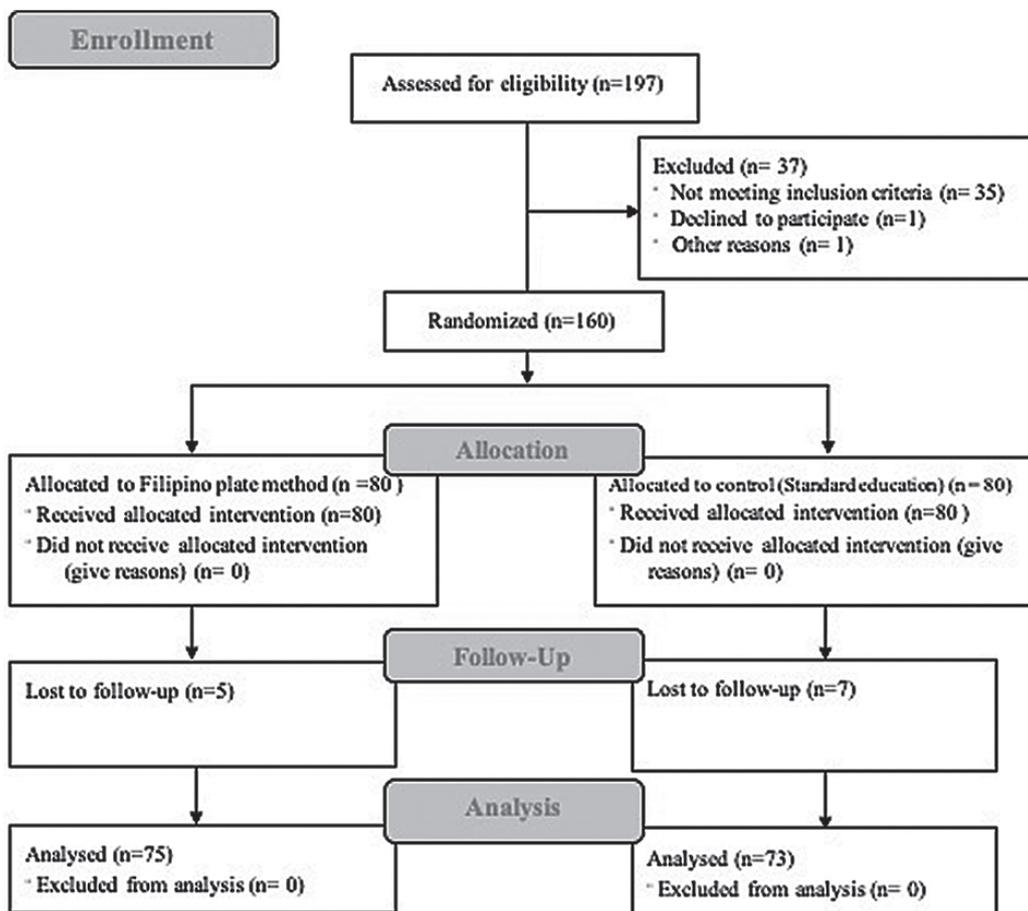**Figure 3.** Participant's flow during the study.

Figure 4. A total of 197 participants were recruited and 148 were included for the study endpoint.

participants had an annual household income of PhP 250,000 and below. There was no statistical difference in the demographic profile of participants in the Filipino plate method group versus those in the standard nutrition group (Table 1). The participants were diagnosed with diabetes for a median of five years prior to the study, with 29 (19.59%) on insulin. More than half of the participants reported compliance with their maintenance medications (Table 2).

In terms of actual plate scores, the scores significantly increased from pre-teaching to post-teaching overall for both groups (pre-teaching score 5/9 vs post-teaching score 8/9, $p<0.001$). Across groups, the Filipino plate method group had a higher median post-teaching score of 8/9 compared to 7/9 for the standard nutrition education group ($p=0.018$) (Table 3).

For the meal planning scores, there was a significant increase from pre-teaching to post-teaching for both groups (pre-teaching score 4/10 vs post-teaching score 5/10, $p<0.001$). Across groups, the post-teaching scores were similar with a median of 5/10 for both groups ($p=0.274$). There was no statistically significant difference in post-teaching scores between the two interventions.

On baseline and on post-teaching, the 2h-PPG absolute values for both groups demonstrated a significant decrease from pre- to post-teaching (pre-teaching score 223.3 mg/dl vs post-teaching score 183.4 mg/dl, $p<0.001$). The post-teaching values for 2h-PPG were significantly lower for the Filipino plate method compared to standard nutrition education (Filipino plate method 173.75 mg/dl vs standard nutrition education 212.1 mg/dl, $p=0.008$). However, the average difference of 2h-PPG values pre- to post-teaching was not statistically significant between the two groups (Filipino plate method -15.6 mg/dl vs standard nutrition education -18.7 mg/dl, $p=0.741$).

DISCUSSION

Medical nutrition therapy is an integral component of diabetes management which greatly impacts glycemic control and clinical outcomes.[6,10-12] Several studies have evaluated the effectiveness of diabetes self-management

Table 1. Demographic profile of participants (n = 148)

	Total (n=148)	Group A Filipino plate method (n=75)	Group B Standard nutrition education (n=73)	p-value
		Median (Range); Frequency (%)		
Age, years	62 (22 – 86)	62 (22 – 86)	62 (28 – 84)	0.855*
Sex				0.312†
Male	40 (27.03)	23 (30.67)	17 (23.29)	
Female	108 (72.97)	52 (69.33)	56 (76.71)	
BMI, kg/m²	24.62 (14.88 – 37.2)	24.56 (15.4 – 34.48)	24.73 (14.88 – 37.2)	0.500*
BMI Classification				
Underweight	10 (6.76)	5 (6.67)	5 (6.85)	0.857†
Normal	75 (50.68)	37 (49.33)	38 (52.05)	
Overweight	52 (35.14)	26 (34.67)	26 (35.62)	
Obese	11 (7.43)	7 (9.33)	4 (5.48)	
Education				0.795†
No formal education	6 (4.05)	3 (4)	3 (4.11)	
Elementary	61 (41.22)	34 (45.33)	27 (36.99)	
High school	37 (25)	19 (25.33)	18 (24.66)	
Vocational	7 (4.73)	4 (5.33)	3 (4.11)	
College	35 (23.65)	14 (18.67)	21 (28.77)	
Post-graduate	2 (1.35)	1 (1.33)	1 (1.37)	
Family annual income (in thousands), Php				0.201†
0-250	129 (87.16)	68 (90.67)	61 (83.56)	
250-400	12 (8.11)	3 (4)	9 (12.33)	
400-800	7 (4.73)	4 (5.33)	3 (4.11)	

Statistical test used: * - Mann-Whitney U test; † - Fisher's exact/Chi-square test

Table 2. Diabetes profile of participants (n = 148)

	Total (n=148)	Group A Filipino plate method (n=75)	Group B Standard nutrition education (n=73)	p-value
		Median (Range); Frequency (%)		
Duration, years [n=136]	5 (0.42 – 44)	6 (0.42 – 30)	5 (0.58 – 44)	0.370*
Regimen				
Diet	7 (4.73)	4 (5.33)	3 (4.11)	1.000†
Oral agents	116 (78.38)	58 (77.33)	58 (79.45)	0.754†
Insulin	29 (19.59)	10 (13.33)	19 (26.03)	0.052†
Adherence to pharmacologic therapy				0.123†
Never	9 (6.08)	7 (9.33)	2 (2.74)	
Seldom	16 (10.81)	6 (8)	10 (13.7)	
Sometimes	38 (25.68)	22 (29.33)	16 (21.92)	
Often	2 (1.35)	2 (2.67)	0 (0)	
Always	83 (56.08)	38 (50.67)	45 (61.64)	

Statistical test used: * - Mann-Whitney U test; † - Fisher's exact/Chi-square test

Table 3. Plate score, meal planning score, and 2h-PPG levels of the Filipino plate method group vs the standard nutrition education group

	Total (n=148)	Group A Filipino plate method (n=75)	Group B Standard nutrition education (n=73)	p-value
	Mean ± SD; Median (Range); Frequency (%)			
Actual plate score	[n=147]	[n=74]	[n=73]	
Pre-teaching	5 (0 – 9)	5 (0 – 9)	5 (1 – 9)	
Post-teaching	8 (3 – 9)	8 (4 – 9)	7 (3 – 9)	0.018*
p-value	<0.001‡	<0.001‡	<0.001‡	
Actual change in scores	3 (-4 – 8)	2 (-4 – 7)	3 (-1 – 8)	0.020*
% change in scores	50 (-44.44 – 800)	60 (-20 – 800)	50 (-44.44 – 700)	0.065*
Meal planning score	[n=145]	[n=73]	[n=72]	
Pre-teaching	4 (0 – 10)	4 (0 – 10)	4 (0 – 8)	
Post-teaching	5 (1 – 10)	5 (1 – 10)	5 (1 – 9)	0.274*
p-value	<0.001‡	<0.001‡	0.004‡	
Change in scores	1 (-7 – 7)	1 (-7 – 6)	1 (-5 – 7)	0.501*
% change in scores	33.33 (-83.33 – 700)	33.33 (-83.33 – 700)	33.33 (-83.33 – 700)	0.475*
2h-PPG	[n=113]	[n=54]	[n=59]	
Pre-teaching	223.2 (101.1 -502.3)	202.25 (101.8 – 502.3)	241 (101.1 – 435.6)	
Post-teaching	183.4 (99.8 – 424.5)	173.75 (104.3 – 424.5)	212.1 (99.8 – 376.4)	0.008*
p-value	<0.001‡	0.002‡	0.004‡	
Change in PPG values	-18.5 (-219.9 – 123.1)	-15.6 (-200.3 – 87.9)	-18.7 (-219.9 – 123.1)	0.741*
% change in PPG values	-8.99 (-61.35 – 86.35)	-8.99 (-50.9 – 63.45)	-9.38 (-61.35 – 86.35)	0.972*

Actual change was calculated as the difference of post- values and pre- values. Percent change was calculated as the actual change/pre- values x 100%.
PPG – Post-prandial glucose
Statistical test used: * - Mann-Whitney U test; † - Fisher's exact/Chi-square test

nutrition training and education,[11,13] such as standard individualized education with a nutritionist, video tapes and lunch demonstrations, providing dietary guides, and group education. These methods have demonstrated an improved knowledge among patients, which further supports the need for nutrition education.

Unfortunately, a large percentage of people with diabetes do not receive any standard diabetes education and/or nutrition therapy.[14,15] Therefore, to bridge the gap in providing the need for nutrition education in the diabetes population, the University of Idaho developed "The Healthy Diabetes Plate," or the Idaho Plate Method in 2004, which was found to be effective in managing nutrition in patients with diabetes.[8] In the Philippines, the Filipino plate method is being used as a tool for nutrition education for general healthy eating,[6] but its effectiveness in teaching patients with diabetes and achieving glycemic control was not studied previously.

The results of our study showed that the Filipino plate method is non-inferior to the standard nutrition education given by registered nutritionist-dietitians, as prescribed by the ADA. The improvement in the meal planning sheet scores and the decrease in the 2h-PPG values were similar for the two groups. On the other hand, the median actual plate scores were better for the Filipino plate method group compared to the standard nutrition education group (Filipino plate method score 8/9 vs standard nutrition education score 7/9, *p*=0.018). It is likely that the actual plate scores for the Filipino plate method group may have been better, because the tool is easier to comprehend and remember than the standard nutrition education.

It is notable that despite reaching significance, there was very little improvement in the meal planning sheet scores from pre-teaching to post-teaching for both groups (pre-teaching median score 4/10 vs post-teaching median score 5/10 for both groups). This is possibly because the participants had poor drawing skills or did not comprehend how to draw the appropriate proportions and plate sizes. The instructions may have been vague and non-specific, leading to a greater variation in the drawings. On the other hand, the significant improvement in the actual plate scores suggest that the participants had better food choices and proportions after nutrition education, despite the somewhat disappointing results of the meal planning sheets.

The significant reduction in 2h-PPG from pre- to post-teaching for both groups also suggests that better food choices and proportions led to better glycemic control. Although the absolute 2h-PPG of the Filipino plate method group was lower than that of the standard nutrition education group, we chose to compare the average individual reduction in 2h-PPG from pre-teaching to post-teaching between the groups. This is due to the wide variation in the pre-teaching 2h-PPG of the participants, which also led to a wide variation in the post-teaching 2h-PPG; therefore, the absolute 2h-PPG values were not good comparative measures.

There are certain limitations to this study: First, the post-teaching results only determined short-term outcomes. Ideally, the meal planning sheet and actual plate scores, as well as the 2h-PPG, should be repeated over several weeks or months after the nutrition education to determine if these interventions had an impact on the long-term outcomes. Second, the post-intervention outcomes were not repeated; thus, the consistency of the results were not established. Third, the study interventions were not blinded to the participants, and the results were not blinded to the researchers. We also recommend that the meal planning sheets and actual plate scores be used in future studies, since there is currently no universally accepted test to determine knowledge and behavior in meal planning and food choices. Lastly, venous blood glucose levels before the meals should ideally be obtained, and the change

from postprandial to preprandial glucose levels should be compared before and after the teaching interventions. This was not done due to budget constraints.

Based on our study results, either the Filipino plate method or the standard nutrition education may be used in teaching patients with diabetes regarding medical nutrition therapy. The Filipino plate method reduces postprandial glucose levels similar to standard nutrition education. The visual Filipino plate method requires less time, knowledge, and skill to teach, thus providing an alternative to standard nutrition education. Because it is simpler, it may also be easier to understand, facilitating comprehension and memory of the healthy food groups and their proportions. The use of the Filipino plate method in the nutrition education of patients with diabetes may make nutrition education more accessible to the population of patients with diabetes.

CONCLUSION

The Filipino plate method is comparable to standard nutrition education in improving meal planning and food choices, as well as improving postprandial glucose in patients with type 2 diabetes.

Practice Implication
The Filipino plate method may be used as a simpler and easier alternative to standard nutrition education in teaching patients with type 2 diabetes about medical nutrition therapy. This method may make nutrition education more accessible to a wider population of patients with diabetes.

References

1. International Diabetes Federation. The Philippines. Available from: https://www.idf.org/our-network/regions-members/western-pacific/members/116-the-philippines.html.
2. Meigs JB. Epidemiology of type 2 diabetes and cardiovascular disease: Translation from population to prevention. Diabetes Care. 2010;33(8):1865-71. PMID: 20668155. PMCID: PMC2909080. https://doi.org/10.2337/dc10-0641.
3. The Diabetes Control and Complications Trial Research Group; Nathan DM, Genuth S, et al. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. N Engl J Med. 1993;329(14):977–86. PMID: 8366922. https://doi.org/10.1056/NEJM199309303291401.
4. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). UK Prospective Diabetes Study (UKPDS) Group. Lancet. 1998;352(9131):837–53. PMID: 9742976.
5. DeFronzo RA, Ferrannini E, Groop L, et al. Type 2 diabetes mellitus. Nat Rev Dis Prim. 2015;1:15019. PMID: 27189025. https://doi.org/10.1038/nrdp.2015.19.
6. Evert AB, Boucher JL, Cypress M, et al. Nutrition therapy recommendations for the management of adults with diabetes. Diabetes Care. 2013;36(11):3821-42. PMID: 24107659. PMCID: PMC3816916. https://doi.org/10.2337/dc13-2042.
7. Camelon KM, Hådell K, Jämsén PT, et al. The plate model: A visual method of teaching meal planning. DAIS Project Group. Diabetes Atherosclerosis Intervention Study. J Am Diet Assoc. 1998; 98(10): 1155-8. PMID: 9787722. https://doi.org/10.1016/s0002-8223(98)00267-3.
8. Idaho plate method. Rexburg (ID): Idaho Plate Method. Available from: http://platemethod.com.
9. DOST-FNRI. Filipino plate method. "Pinggang Pinoy." Available from: https://www.fnri.dost.gov.ph/index.php/tools-and-standard/pinggang-pinoy.
10. Franz MJ, Powers MA, Leontos C, et al. The evidence for medical nutrition therapy for type 1 and type 2 diabetes in adults. J Am Diet Assoc. 2010;110(12):1852-89. PMID: 21111095. https://doi.org/10.1016/j.jada.2010.09.014.
11. Davies MJ, D'Alessio DA, Fradkin J, et al. Management of hyperglycaemia in type 2 diabetes, 2018. A consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD) Diabetologia. 2018;61(12):2461–98. PMID: 30288571. https://doi.org/10.1007/s00125-018-4729-5.
12. Diabetes Canada Clinical Practice Guidelines Expert Committee. 2018 Clinical Practice Guidelines for the prevention and management of Diabetes in Canada. Can J Diab. 2018;42(Suppl 1):S1-S325. Available from: http://guidelines.diabetes.ca/docs/CPG-2018-full-EN.pdf.
13. Norris SL, Engelgau MM, Narayan KM. Effectiveness of self-management training in type 2 diabetes: A systematic review of randomized controlled trials. Diabetes Care. 2001;24(3):561–87. PMID: 11289485. https://doi.org/10.2337/diacare.24.3.561.
14. Siminerio LM, Piatt G, Zgibor JC. Implementing the chronic care model for improvements in diabetes care and education in a rural primary care practice. Diabetes Educ. 2005;31(2):31:225–234. PMID: 15797851. https://doi.org/10.1177/0145721705275325.
15. Siminerio LM, Piatt GA, Emerson S, et al. Deploying the chronic care model to implement and sustain diabetes self-management training programs. Diabetes Educ. 2006;32(2):253–60. PMID: 16554429. https://doi.org/10.1177/0145721706287156.