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UNIT NO. 3

LOCALISING STRUCTURED LIFESTYLE INTERVENTION FOR DIETARY MANAGEMENT SUCCESS

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ABSTRACT

The growing prevalence of type 2 diabetes mellitus (T2DM) and the parallel increase in the prevalence of obesity warrants for effective intervention strategies. Overweight/obese patients with T2DM who attempt weight reduction often face considerable challenges. A recent study in Malaysia conducted among overweight/obese patients with T2DM showed that weight reduction and improved glycaemic control could be achieved with structured lifestyle intervention and the incorporation of behavioural counselling. The structured lifestyle recommendations in this study consisted of 1) a fixed low-calorie diet plan of 1200 kcal/day for female and 1500 kcal/day for male patients; 2) incorporation of one or two servings/day of diabetes-specific formula as a meal replacement; 3) a 14-day structured meal plan consisting of the ingredients list, cooking methods and nutrition facts; and the 4) healthy low-calorie snack options. Exercise prescription of ≥150 min/week of moderate-intensity was also encouraged. Behavioural counselling such as motivational interviewing not only facilitated adherence to the lifestyle recommendations but also further enhanced weight loss and glycaemic control in these patients. This article outlines the localisation of the structured lifestyle recommendations and its effectiveness in achieving weight loss and good glycaemic control in overweight/obese patients with T2DM.

Keywords: Diabetes, structured lifestyle, weight loss, meal replacements, glycaemic control

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INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a major health concern of the 21st century due to the dramatic rise in the global prevalence. In Malaysia, T2DM is prevalent in 17.5 percent of the adult population, over double since 1996.[1] Obesity is also predominant in 83.4 percent of Malaysians with T2DM[2], and consistently the glycaemic control in these patients have worsened with the rise in mean haemoglobin A1c (HbA1c) level from 8.0 percent in 2003 to 8.66 percent in 2008.[3] Only 22 percent of Malaysians with T2DM achieved the HbA1c target of <7 percent, the lowest rate since 1998.[3]

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Medical Nutrition Therapy (MNT) consisting of a healthful eating pattern and regular physical activity, is an important component in the management of diabetes alongside pharmacotherapy. It is well established that part of the role of MNT is to achieve weight reduction as a key therapeutic goal for the prevention and management of T2DM.[4] Weight reduction with intensive lifestyle modifications has been shown to reduce the incidence of diabetes by 58 percent.[5] For individuals with T2DM, the Look AHEAD study reported that a loss of 5–10 percent of body weight can improve fitness, reduce HbA1c levels, improve cardiovascular disease risk factors, and decrease the use of diabetes, hypertension, and lipid-lowering medications.[6,7] Nevertheless, adherence to lifestyle changes as prescribed by the MNT is often a challenge. In Malaysia, 80 percent of patients with T2DM consume four or more meals a day and ate more than two carbohydrate portions per snack.[8] Only 16.4 percent of patients adhered to the dietary regimen provided by dietitians.[9] Several studies showed that weight reduction and glycaemic control in patients with overweight/obesity and T2DM was more feasible and had better adherence when structured lifestyle recommendations were provided.[10-12]

EVIDENCE FOR STRUCTURED LIFESTYLE INTERVENTION

In the Look AHEAD study[10], overweight/obese patients with T2DM who were randomly assigned into the intensive lifestyle intervention (ILI) group lost significantly more weight and achieved greater HbA1c reduction compared to patients who received standard diabetes management and support. The ILI group received a structured low-calorie diet plan of 1200-1800 kcal/day, with meal replacements and one snack, ≥175 min/week of moderate-intensity physical activity and behaviour modifications for weight loss of ≥7 percent.

Similarly, in the Why WAIT programme,[11] overweight/obese patients with T2DM who received a structured lifestyle intervention had 82.3 percent of patients achieving the target HbA1c of <7 percent, and 69.4 percent of patients were able to reduce their HbA1c to <6.5 percent within 12 weeks. The successful patients were prescribed with low-calorie diet plans, used meal replacements, ate calorie-controlled snacks, and as well as prescribed with an exercise regime, behaviour modifications, group education, and medication adjustment.

We recently published the effectiveness of the structured approach in a lifestyle intervention study in overweight/obese patients with T2DM in Malaysia.[13] We randomised 230 T2DM patients with overweight/obesity and HbA1c >7 percent to receive usual care or structured lifestyle intervention for six months, delivered with behavioural counselling technique. Patients receiving the structured lifestyle intervention demonstrated significant improvements in their

glycaemic control, body weight reduction, and lowering of blood pressure. The structured intervention consisted of low-calorie diet plans, diabetes-specific meal replacements, and increased physical activity.

HOW TO IMPLEMENT STRUCTURED LIFESTYLE INTERVENTION FOR DIABETES?

There are several key features of the structured lifestyle approach.

First, providing patients with low-calorie diet plans is key in the structured approach. A calorie restriction of 500-1000 kcal/day from the usual dietary intake is required to create a negative energy balance. In several successful structured lifestyle interventions, overweight/obese patients with T2DM were prescribed with fixed low-calorie diets of approximately 1200-1500 kcal/day for female and 1500-1800 kcal/day for male patients to produce a successful reduction in weight and HbA1c.[10-13] For long-term weight reduction, the daily calorie intake should be reduced gradually between 250-500 kcal rather than a dramatic reduction of 750-1000 kcal to enhance compliance.[14] Reasonable and paced calorie reductions have improved patients' adherence and helped patients continue on the recommended dietary plan for a longer duration of time.[14] Total daily carbohydrate intake should be no less than 130 g/day, with 15-20 percent calories contribution from protein and the remaining 25-30 percent calories from fat.[15] The low-calorie diet plans should also incorporate high fibre foods (e.g. whole grains, fresh fruits, and vegetables) and healthy carbohydrate consumption, especially sources low in glycaemic index.[15]

Second, the incorporation of meal replacements to achieve low-calorie intake is another key feature of a structured approach. As part of comprehensive diabetes management, meal replacements have shown to effectively facilitate weight loss and maintenance in overweight/obese patients with T2DM.[16] Commercial meal replacements in the form of shakes, bars, and ready-to-mix powders can be used to replace one or two meals or snacks each day to reduce daily calorie intake.[7,10-14] Meal replacements are not only easy to prepare, but also reduces exposure to tempting foods, provides sensory satiety, and removes the need for portion control and calorie counting, which is vital for individuals with poor dietary adherence.

Meal replacements should provide 200-250 calorie replacements and can be used as a sole source of nutrition or taken with conventional foods.[15] Meal replacements are generally used as an absolute replacement of an agreed-upon number of meals/snacks (usually one to two/day) as part of a structured diet plan.[11,14] Today's commercial meal replacements are mostly palatable and offered in different flavours and formats that are generally accepted.[10-14] In the Look AHEAD study, the higher the reliance on meal replacements, the higher the odds were of achieving weight loss goals.[17] Participants in the highest quartile of meal replacements usage had a 4.0 times greater odds of achieving a seven percent weight loss and a 4.1 times greater odds of achieving the ten percent weight loss mark.[17]

Third, in the structured approach, it is essential for patients to be provided with menu plans consisting of detailed meal ingredients, cooking instructions, and nutrition facts.[11,12,14] Specific suggestions for daily meal intake can help patients simplify the decision-making process and make dietary recommendations easier to follow. Detailed meal plans allow patients to modify and explore a variety of healthy low-calorie meals, as well as mix and match meals for eating. This, in return, prevents patients from experiencing dietary fatigue with prolonging intake of the same or similar meal replacements. Additionally, nutrition facts labelling for each meal help guide patients to keep within their calorie recommendations and prevent overeating. Studies have shown that structured meal plans increase dietary adherence and can be easier to follow than a list of general guidelines.[11,12,14]

Fourth, it is important to provide a list of healthy, calorie-controlled snack options for patients following a weight loss diet plan to keep within the targeted total daily calorie intake. In a structured approach, snacks of one or two exchanges of carbohydrates, ~100-to-150 calories (e.g. fruits, steamed "Kuih", salads or nuts) may be consumed with meal replacements during breakfast, lunch or dinner or in-between meals. Snacks should be calculated within the prescribed total daily calories.

Fifth, it is important to provide solutions to some dietary challenges that can occur. Hunger is usually the main challenge when calories are restricted. To overcome hunger, patients are encouraged to include fibre-rich foods (e.g. fruits, vegetables, whole grains, and beans) as part of their meal plan. Patients can also snack on foods that reduce hunger such as nuts or green tea, which are mild hunger suppressants. Reducing total daily calorie intake to achieve negative energy balance can also pose a challenge to patients in weight loss programs. Therefore, it would be best to include low-fat or fat-free options when consuming meals. Salads, for example, can be prepared using low-fat or fat-free dressings such as natural herbs and leaves like pepper and mint leaves, lemon juice, vinegar, or low-fat mayonnaise. Patients can consume a bowl of plain vegetable-based soup instead of creamy soups as a first course, where they are more likely to end up eating fewer total calories at that meal. To prevent boredom and fatigue from meal replacements intake and improve adherence, specials recipes to prepare shakes, smoothies, and flavoured drinks are encouraged using one or two carbohydrate portions (100-150 calories) of fruits with the meal replacements.

Lastly, structured lifestyle intervention should be delivered using behavioural counselling strategies. In the Malaysian study[13], we demonstrated that patients who were counselled using motivational interviewing along with structured lifestyle intervention showed a greater extent of a 2-fold reduction in their body weight and HbA1c at six months with 50 percent lower weight regain at one year compared to patients receiving conventional counselling for structured lifestyle intervention.

A sample menu of a 1200-1500 kcal diet with snack options is shown in Table 1.

CONCLUSION

In the Malaysian study[13], providing a structured lifestyle intervention helped patients simplify the decision-making process and made dietary changes easier to follow. The incorporation of behavioural counselling such as motivational interviewing further enhanced lifestyle adherence and led to significantly better diabetes and weight control. Therefore, in the Malaysian population, where 80 percent of them do not adhere to dietary recommendations, and 70 percent of Malaysians do not adopt a physically active lifestyle, the structured approach could provide the much-needed MNT intensity.

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LEARNING POINTS

- **Overweight/obese patients with T2DM could benefit from weight loss of 5-10 percent as modest weight loss reduces cardiovascular risk factors associated with T2DM and improves hyperglycaemia.**
- **Provision of structured meal plans simplifies the task of following the prescribed diet and consequently lead to better adherence.**
- **Incorporating behavioural counselling such as motivational interviewing can help motivate patients and facilitate adherence to lifestyle recommendations and consequently lead to significantly better diabetes and weight control.**

Table 1: Sample menu of structured meal plan 1200-1500 kcal

<table>
<tr><td colspan="2">Breakfast – 300 kcal</td></tr>
<tr><td colspan="2">Meal replacement formula (one serving) + Small banana (one serving) – 300 kcal</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2">Lunch/ Dinner – 300- 500 kcal</td></tr>
<tr><td colspan="2">Soup noodle (one bowl) OR
Rice, preferably brown (1 ½ scoop) with Assam fish/braised chicken/steamed tofu (one palm size serving) + Stir-fried green vegetables (one cup) + Honeydew / Guava/Papaya (one serving) + Chinese Tea – 500 kcal</td></tr>
<tr><td colspan="2">OR</td></tr>
<tr><td colspan="2">Meal replacement formula (one serving) + Salad/ Fruit (one serving) – 300 kcal</td></tr>
<tr><td colspan="2">Snacks – 100 kcal</td></tr>
<tr><td>Apam steamed, kuih
Wet popiah, kuih
Sweet potato, steamed
Plain corn, steamed
Chickpeas, boiled
Red bean soup, unsweetened</td><td>Wholegrain crackers, plain
Lempeng, plain
Putu piring
Low-fat yogurt, plain
Tau Fu Fah, unsweetened
Vegetable pau, small</td></tr>
</table>