



## ROLE OF DIETARY BEHAVIOUR AND LIFESTYLE PRACTICES IN THE PREVENTION OF PREDIABETES: A REVIEW

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**ABSTRACT** Elevated blood glucose levels and an increased risk of type 2 diabetes mellitus are hallmarks of prediabetes, a metabolic disorder. A serious public health problem, especially in emerging nations, is the increasing incidence of prediabetes. It is well known that changing one's diet and changing one's lifestyle can stop a disease from getting worse. The goal of this review paper is to investigate how dietary habits, exercise, weight control, and behavioural changes can help prevent and treat prediabetes. Glycaemic control is much improved by consuming more whole grains, dietary fiber, fruits, and vegetables while consuming fewer refined carbohydrates and saturated fats, according to data from numerous national and international research. Insulin sensitivity is further improved by regular exercise, weight loss, and stress reduction. It has also been discovered that structured nutrition education programs lower metabolic risk and encourage healthy eating habits. The review emphasizes that a sustainable and affordable strategy for lowering the burden of type 2 diabetes is early intervention through dietary and lifestyle changes.

**KEYWORDS :** Prediabetes, Diet, Lifestyle Modification, Physical Activity

### INTRODUCTION

Elevated blood glucose levels that are above normal but not high enough to be considered diabetes define prediabetes, an intermediate metabolic state. It is regarded as a high-risk condition for the development of type 2 diabetes and cardiovascular illnesses, and it is linked to insulin resistance and impaired glucose tolerance (American Diabetes Association, 2022). The rising frequency of prediabetes in both urban and rural populations has been largely attributed to the growing prevalence of obesity, bad eating habits, and sedentary lifestyles.

Maintaining metabolic health and controlling blood glucose levels are fundamentally influenced by diet. Insulin resistance and weight gain result from consuming too much refined carbs, sugar-sweetened beverages, and saturated fats. Conversely, diets high in fruits, vegetables, whole grains, legumes, and low-fat dairy products enhance glucose metabolism and lower the incidence of metabolic diseases (Hu, 2011). Glycaemic imbalance is made worse by lifestyle variables such stress, lack of exercise, irregular eating habits, and insufficient sleep.

Diabetes can be delayed or avoided by identifying and changing these risk factors early on. Planning successful intervention strategies therefore requires an awareness of how dietary behavior and lifestyle choices contribute to the prevention of prediabetes.

### Objective

1. To examine how dietary habits can help prevent prediabetes.
2. To investigate how lifestyle choices affect glycaemic status.
3. To emphasize the significance of behavioral change and nutrition education.

### METHODOLOGY

Secondary data gathered from peer-reviewed journals, national and international health organizations' publications, and published research articles about nutrition, lifestyle, and prediabetes served as the foundation for this review. We looked through databases like WHO reports, PubMed, and Google Scholar. Included were studies on food consumption, physical activity, weight management, and glycaemic control that were published between 2005 and 2023. To make inferences, pertinent data was gathered and examined.

### Role of Dietary Behaviour In Prediabetes Prevention

One of the risk factors for prediabetes that can be changed the most is dietary intake. Rapid blood glucose increases and elevated insulin demand are caused by high consumption of refined grains and sweets. Consuming these items over time increases the risk of insulin resistance. On the other hand, diets high in fiber and whole grains increase the postprandial glycaemic response and decrease the absorption of glucose (Slavin, 2013).

Antioxidants, vitamins, and minerals found in fruits and vegetables improve metabolism and lower inflammation. According to studies, those who eat five or more servings of fruits and vegetables each day are less likely to have impaired glucose tolerance (WHO, 2020). Pulses and legumes are good for glycaemic control since they have a low glycaemic index and offer plant-based protein.

The quality of dietary fat is also crucial. Insulin sensitivity is improved when unsaturated fats from nuts, seeds, and vegetable oils are substituted for saturated fats (Salas-Salv n et al., 2011). Overeating should be avoided and stable blood glucose levels can be maintained with regular meal timing and portion control.

### Impact of Lifestyle Practices

Obesity and metabolic diseases are closely linked to sedentary behavior. Exercise enhances insulin sensitivity and increases muscle absorption of glucose. People at risk for diabetes have been advised to engage in moderate-intensity exercise for at least 150 minutes each week (Colberg et al., 2016).

Yoga, walking, cycling, and housework are all simple and efficient ways to get your body moving. Regular exercise programs have been shown to significantly lower body weight and fasting blood glucose levels.

Glycaemic regulation is also influenced by stress management and sleep patterns. Weight gain results from hormonal imbalance and increased appetite caused by insufficient sleep. Insulin resistance is exacerbated by chronic stress, which raises cortisol levels.

### Role of Nutrition Education

The promotion of healthy eating habits is greatly aided by nutrition education. Knowledge about portion control, culinary techniques, and food selection is enhanced by organized instructional programs. Adopting durable lifestyle changes is encouraged by behavioral counselling.

Among high-risk populations, community-based interventions have shown improvements in nutritional consumption, physical activity, and weight control (Knowler et al., 2002). Group instruction, visual aids, and hands-on demonstrations all improve compliance.

**Table 1: Summary of Selected Studies on Lifestyle Intervention and Prediabetes**

Author(s)	Year	Study Population	Intervention	Major Findings
Tuomilehto et al.	2001	Adults with impaired glucose tolerance	Diet and physical activity intervention	Reduced incidence of type 2 diabetes by 58%

Knowler et al.	2002	High-risk adults	Lifestyle modification programme	Significant reduction in diabetes risk
Ramachandran et al.	2006	Indian adults with prediabetes	Lifestyle intervention	Delayed progression to diabetes
Lindström et al.	2006	Prediabetic adults	Diet and exercise counselling	Improved glycaemic control and weight management
Salas-Salvadó et al.	2011	Adults at metabolic risk	Healthy dietary pattern	Improved insulin sensitivity

**Interpretation**

The studies consistently demonstrate that dietary modification and physical activity are effective strategies for preventing progression from prediabetes to diabetes.

**Anthropometric Indicators and Risk**

Key markers of metabolic risk include body mass index, waist circumference, and waist-hip ratio. Prediabetes and insulin resistance are closely linked to central adiposity. Glycaemic parameters are greatly improved by losing weight through food and exercise.

It has been demonstrated that even a small weight loss of 5–7% can lower the chance of developing diabetes (Diabetes Prevention Program Research Group, 2002). As a result, early intervention depends on tracking anthropometric measurements.

**DISCUSSION**

The review emphasizes how lifestyle and dietary factors work together to avoid prediabetes. Glucose metabolism is enhanced by a well-balanced diet that is high in fiber, low in refined carbohydrates, and moderate in healthy fats. Maintaining a healthy weight and engaging in regular exercise also improve insulin sensitivity.

By raising awareness and motivation, nutrition education acts as a catalyst for changes in behavior. Individual therapies are less successful than a combination of education, physical activity, and food adjustment.

These results highlight the necessity of lifestyle modification-focused health programs at the community level. Diabetes and its related consequences might be lessened with early screening and counselling.

**Table 2: Dietary and Lifestyle Factors Associated with Prediabetes Prevention**

Factor	Recommended Practice	Expected Benefit
Whole grains	Daily consumption	Improved glycaemic response
Dietary fibre	25–35 g/day	Better insulin sensitivity
Fruits and vegetables	Minimum 5 servings/day	Reduced oxidative stress
Physical activity	≥150 min/week	Improved glucose utilization
Weight management	5–7% weight reduction	Reduced diabetes risk
Adequate sleep	7–8 hours/day	Better metabolic regulation
Stress management	Yoga, meditation, relaxation	Improved hormonal balance

**Interpretation**

The combined effect of healthy dietary behaviour and positive lifestyle practices contributes significantly to metabolic health and diabetes prevention.

**CONCLUSION**

It is possible to reverse prediabetes if the right lifestyle changes are made early on. Effective methods to stop the development of diabetes include weight control, regular exercise, healthy eating habits, and nutrition education. In order to improve metabolic health, public health initiatives should give priority to awareness campaigns and encourage the consumption of healthful foods.

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