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Self-Reported Nutritional Habits Among Adults With and Without Type 2 Diabetes Mellitus

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ABSTRACT

Knowing what type 2 diabetes mellitus (T2DM) patients intend or claim to do regarding their food intake may help in their diabetes management. But how do individuals withT2DM compare with those without T2DM in their self-reported nutritional intent and use of popular "diets"? In 2006, the **S**tudy to **H**elp **I**mprove **E**arly evaluation and management of risk factors **L**eading to **D**iabetes (SHIELD), the largest survey of its kind, evaluated individuals with (n=3,551) and without (n=8,318) T2DM, including questions about their meal composition and diet plans (Table). T2DM respondents reported clinically and statistically increased efforts in "trying" to alter specific food intakes, compared with those without T2DM (eg, "limiting calories", "eating less bad carbohydrates" and "limiting the amount of sugar"). While statistically significant, those with T2DM did not report clinically meaningful differences in following a specific meal plan compared with those without T2DM; the majority of both groups reported: "have not followed any specific diet plan." This analysis suggests that individuals with T2DM "try" to alter specific food intakes more than those without T2DM. However, whether it be recommended by healthcare providers or promoted by advertisements and books, a majority did not follow any specific diet plan.

BACKGROUND

- The annual US expenditure on care for diabetes mellitus and its complications is estimated to be $174 billion[1]
- A cornerstone of the ADA's Clinical Practice Recommendations and Standards of Medical Care in Diabetes is medical nutrition therapy[2]
  - Individuals with or at risk for diabetes should receive individualized medical nutrition therapy as needed to achieve treatment goals
- For overweight individuals at high risk for or who have T2DM, dietary strategies include reduced calories, reduced intake of dietary fat, reduced carbohydrate intake, and increased intake of dietary fiber and foods containing whole grains
- Individuals are often counseled by their clinicians, dietitians, and other healthcare providers regarding nutrition and diet. Various medical organizations and other public resources are readily available with nutritional guidelines and recommendations as well. However, the extent to which these recommendations are incorporated into daily life among individuals with T2DM is unknown

OBJECTIVE

- Assess the self-reported nutritional habits and use of diet plans among respondents with and without T2DM

METHODS

Study Design

- Data were derived from the Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes (SHIELD), a 5-year population-based survey conducted to better understand the risk for the development of diabetes mellitus, as well as disease burden
  - Based upon a screening questionnaire mailed to 200,000 nationally representative households, responses were obtained for 211,097 adults from 127,420 households (64% response rate)
  - A baseline survey was sent to a stratified random and representative sample of 22,001 individuals from the screening respondents. Annual follow-up surveys were sent to individuals responding to the baseline survey

METHODS (Continued)

Study Design (Continued)

- This investigation is a cross-sectional analysis of the 2006 survey to determine the nutritional habits for respondents with and without T2DM
  - The 2006 survey was sent to 18,445 individuals, with a response rate of 75% (n = 13,887). Individuals with T2DM represented 27% of the respondents in 2006

Study Population

- Respondents were categorized as having T2DM based upon self-report of having been told by a doctor, nurse or other healthcare professional that they had T2DM
- A comparison cohort was identified as respondents not having T2DM, those who reported no diagnosis of either T2DM, T1DM, gestational or unspecified diabetes

Study Measures

- Nutritional habits:
  - Respondents answered a survey question worded as "which of these are you currently trying to do with your diet," with response options of "don't try to do this," "trying a little," "trying some of the time," "trying most of the time," "trying very hard every day". Respondents were asked to respond to each nutritional habit
    - Limit calories
    - Eat less fat
    - Eat more fiber
    - Limit amount of meat
    - Eat more fruit
    - Eat more vegetables
    - Eat more protein
    - Eat less bad carbohydrates
    - Limit amount of sugar
- Diet plans:
  - Additionally, respondents were asked if they "had followed any of the diet plans (or eating plans) listed below in the past 6 months". Respondents were asked to check all diet plans that applied
    - Therapeutic Lifestyle Diet (TLC)
    - Other low-fat, high–complex carbohydrate diet
    - Atkins
    - South Beach
    - Other low-carbohydrate diet
    - Weight Watchers
    - Other low-calorie diet
    - Vegetarian diet/vegan diet
    - Other
    - Have not followed any specific diet plan

Statistical Analyses

- This analysis assessed respondents who reported "trying most of the time" or "trying very hard every day" to modify their nutritional intake
- The proportion of respondents reporting each nutritional habit or diet plan was computed
- Comparisons between respondents with and without T2DM were made using chi-square tests

RESULTS

From the 2006 SHIELD survey, 3,551 respondents with diagnosis of T2DM and 8,318 respondents without diagnosis of T2DM completed the nutrition questions.

Table 1. Characteristics of SHIELD respondents with and without T2DM

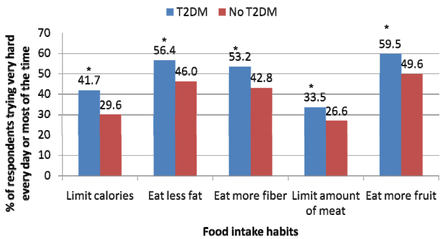
Characteristics	T2DM n = 3,551	No T2DM n = 8,318
Age, years, mean (SD)	61.5 (12.4)*	55.8 (16.3)
Women, %	60	61
Race, % white	85*	89
Income, % <$35,000/year	46*	35
Education, % with no more than a high school degree	36*	29
Have health insurance, %	91	90
Body mass index, kg/m^2, mean (SD)	34.1 (8.4)	30.2 (7.0)
Body mass index ≥ 30 kg/m^2, %	64	45

*p < 0.001 for comparison of T2DM vs. No T2DM

- Significantly fewer T2DM respondents were white, compared with No T2DM respondents
- A significantly larger proportion of T2DM respondents were older, had lower income, and had less education, compared with No T2DM respondents

Nutritional Habits

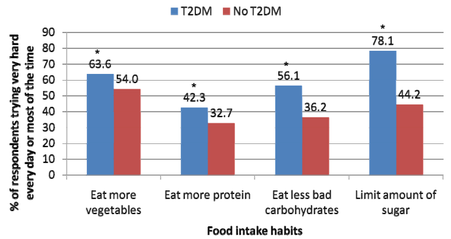
Figure 1A. Proportion of respondents who reported currently trying to alter specific food intake components



*p < 0.001 for comparison of T2DM vs. No T2DM

- Significantly more T2DM respondents reported trying to alter specific components of food intake, compared with respondents without T2DM (p < 0.001) (Figure 1A)
- More than 41% of T2DM respondents reported trying to limit calories, compared with 30% of respondents without diabetes (p < 0.001)
- More than 53% of T2DM respondents reported trying to eat less fat, eat more fiber, or eat more fruit, compared with <50% of respondents without diabetes (p < 0.001)
- No more than 60% of T2DM respondents reported that they were trying to make food intake changes most of the time or every day

Figure 1B. Proportion of respondents who reported currently trying to alter specific food intake components

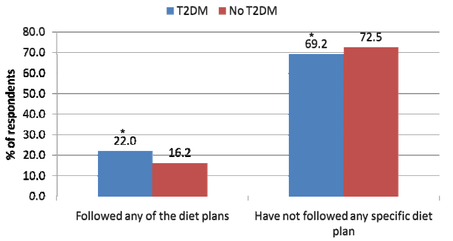


*p < 0.001 for comparison of T2DM vs. No T2DM

- Significantly more T2DM respondents reported trying to alter specific components of food intake, compared with respondents without T2DM (p < 0.001) (Figure 1B)
- More than 56% of T2DM respondents reported trying to eat more vegetables, eat less carbohydrates, or limit amount of sugar, compared with 36%–54% of respondents without diabetes (p < 0.001)
- Approximately two-thirds to three-quarters of T2DM respondents reported trying to eat more vegetables or limit amount of sugar

Diet Plans

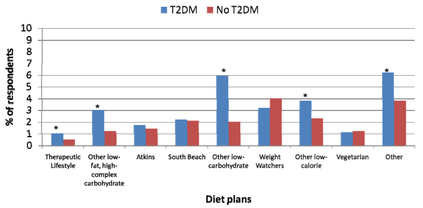
Figure 2. Self-reported use of diet plans among SHIELD respondents



*p < 0.001 for comparison of T2DM vs. No T2DM

- More than two-thirds of both T2DM and No T2DM respondents, reported not following any specific diet plan
- Overall, 22% of T2DM respondents reported following any of the specified diet plans

Figure 3. Proportion of respondents who reported following a specific diet plan



*p < 0.001 for comparison of T2DM vs. No T2DM

- Less than 6% of respondents, either T2DM or No T2DM, reported following a specific diet plan
- For the Therapeutic Lifestyle diet, other low-fat, high–complex carbohydrate diet, other low-carbohydrate diet, and other low-calorie diet, significantly more T2DM respondents reported following these diet plans than respondents without diabetes (p < 0.001)

LIMITATIONS

- The determination of T2DM was made based upon self-report rather than clinical or laboratory measures
- Household panels, like the SHIELD study, tend to under-represent the very wealthy and very poor segments of the population and do not include military or institutionalized individuals
- Self-selection bias may be present because respondents were those who could read and comprehend the survey

SUMMARY

- T2DM respondents reported significantly increased effort in trying to alter specific food intakes, compared with respondents without T2DM
- Less than a quarter of the respondents reported following a specific diet plan

CONCLUSIONS

- Individuals with T2DM try to alter specific food intakes more than those without T2DM
- The majority of T2DM and No T2DM respondents did not follow any specific diet plan
- Given the high prevalence of excessive body weight among those with T2DM[3], and given that nutritional recommendations are readily available, more effective efforts need to be made in promoting the implementation of appropriate nutritional interventions

References

1. American Diabetes Association. *Diabetes Care* 2008; 31:596–615
2. American Diabetes Association. Clinical Practice Recommendations 2009. *Diabetes Care* 2009; 32:S6–S12
3. Bays HE, et al. *Int J Clin Prac* 2007; 61 :737-747

List of Abbreviations

ADA American Diabetes Association
SHIELD Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes
T2DM Type 2 diabetes mellitus
US United States

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