

# Healthcare Resource Utilization among Adults with Type 2 Diabetes Mellitus, Hypertension, and Obesity

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## BACKGROUND

- It is well documented that diabetes is a prevalent and costly disease<sup>1,2</sup>
- With clinical practice guidelines and quality-of-care initiatives in diabetes, patients with diabetes should be frequent consumers of healthcare resources for routine physician visits, eye and foot examinations, monitoring of therapy, and management of glucose and other comorbid conditions<sup>3</sup>
- Hypertension, obesity, cigarette smoking, and hyperlipidemia act as independent modifiable contributors to CVD in patients with diabetes.<sup>4</sup> Thus, individuals with multiple conditions, such as diabetes, hypertension, and obesity, would be expected to have high resource utilization as these conditions are monitored and treated
- Notwithstanding, little information is available on specific use of healthcare resources among individuals with the triad conditions of diabetes, hypertension, and obesity who are treated in the community

## OBJECTIVE

- Compare healthcare resource utilization among adults with T2DM, hypertension, and obesity with those with T2DM alone

## METHODS

### STUDY DESIGN

- Cross-sectional analysis of healthcare resource utilization among SHIELD respondents with T2DM with or without hypertension and obesity
- Study to **H**elp **I**mprove **E**arly evaluation and management of risk factors **L**eading to **D**iabetes (SHIELD), a 5-year population-based survey conducted to better understand the risk for the development of diabetes, as well as disease burden
  - Based upon a screening questionnaire mailed to 200,000 nationally representative households, responses for 211,097 adults from 127,420 households (64% response rate) were obtained
  - A baseline survey was sent to 22,001 selected individuals derived from the screening respondents. Since 2005, annual SHIELD surveys have captured self-reported information on health status, attitudes and behaviors, quality of life and anthropometry from this representative sample of the US population
  - The 2008 survey collected information on individuals with the triad conditions and had a response rate of 71% (n = 14,921)

## METHODS (Continued)

### STUDY POPULATION

- Respondents were 18 years of age or older
- Self-reported diagnosis of T2DM was based on being “told by a doctor, nurse, or other healthcare professional that you have type 2 diabetes”
- Among the T2DM sample, two cohorts were identified:
  - Those reporting comorbid hypertension and obesity
  - Those without a self-report of hypertension and obesity
- Respondents reported a diagnosis of hypertension based on being told by a healthcare professional that they had high blood pressure/hypertension
- Obesity was defined as a BMI  $\geq 30$  kg/m<sup>2</sup>
- Respondents had to have a self-reported diagnosis of T2DM and hypertension and BMI  $\geq 30$  kg/m<sup>2</sup> to be included in the triad condition group. Respondents with a self-reported diagnosis of T2DM and no self-reported diagnosis of hypertension and BMI  $< 30$  kg/m<sup>2</sup> were classified into the T2DM alone group

### STUDY MEASURES

- Respondents reported the number of times or number of days in the past 12 months that they visited or stayed overnight for each type of health facility due to their health problems
  - Hospital
  - Emergency room or urgent care facility
  - Physician

### STATISTICAL ANALYSES

- Comparisons between the triad condition group and the T2DM alone group were conducted using chi-square test for categorical variables and t-tests for continuous variables
- Statistical significance was set *a priori* as p < 0.05

## RESULTS

A total of 1,395 respondents had T2DM, hypertension, and obesity, and 370 had T2DM alone

**Table 1. Characteristics of SHIELD respondents with triad conditions or T2DM alone**

Characteristics	T2DM + HTN + Obesity (n = 1,395)	T2DM alone (n = 370)
Age, years, mean (SD)	61.4 (10.8)*	66.2 (12.9)
Women, %	65*	46
Caucasian, %	73*	77
Education, % with at least some college	66	67
Income, % with household income $\geq$ \$30,000/year	61*	73

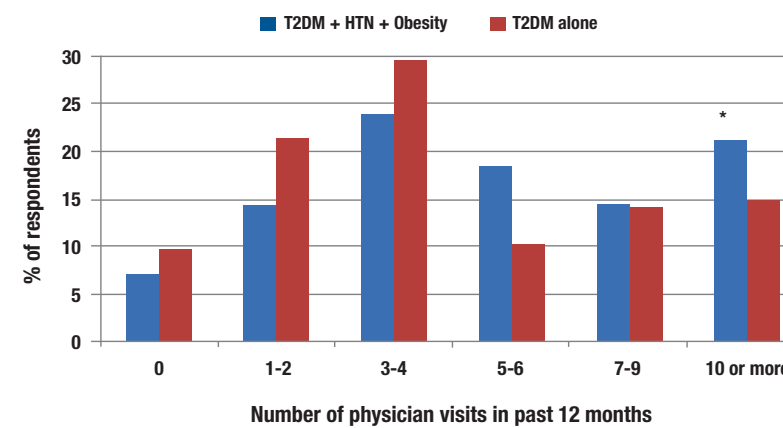
\*p < 0.01

- Respondents with the triad conditions were younger, more often women, less often Caucasian, and had lower household income than respondents with T2DM alone (p < 0.001) (Table 1)

## RESULTS (Continued)

### Healthcare Resource Utilization

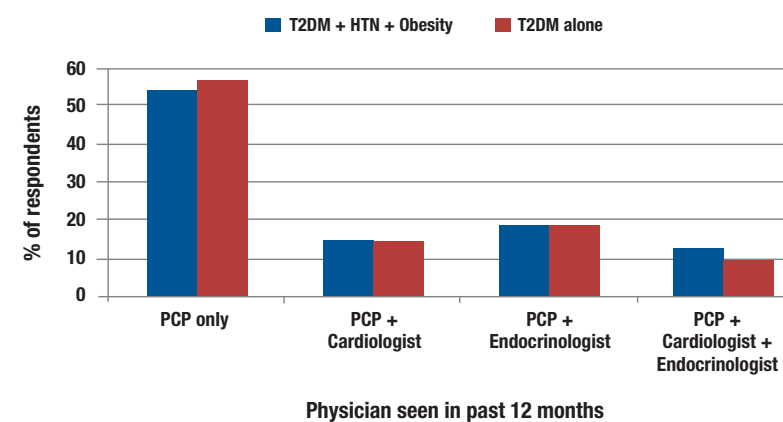
**Figure 1. Number of physician visits in the past 12 months**



\*p = 0.03

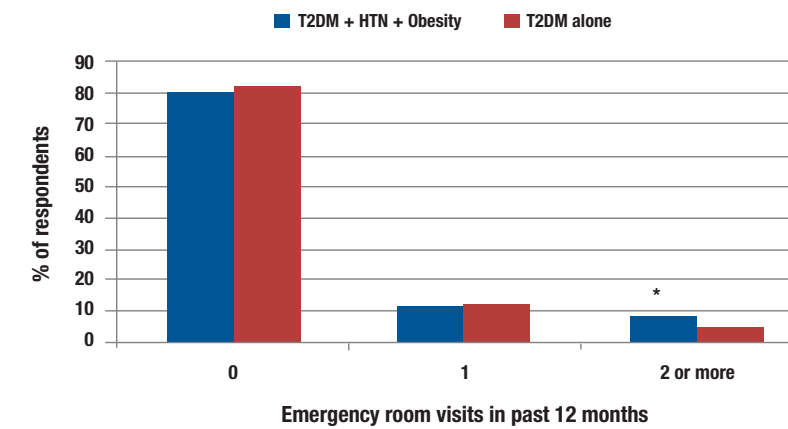
- Respondents with T2DM, hypertension, and obesity had significantly more physician visits (mean = 7.7 vs. 6.0) than respondents with T2DM alone (p = 0.001) (Figure 1)
- More respondents with the triad conditions had 10 or more physician visits in the past 12 months than respondents with T2DM alone (p = 0.03); moreover, 5.7% of respondents with the triad conditions versus 1.9% of T2DM alone had 20 or more physician visits

**Figure 2. Type of physician visit in the past 12 months**



- A similar proportion of respondents with the triad of conditions saw their primary care physician, endocrinologist, and/or cardiologist as respondents with T2DM alone (p > 0.05) (Figure 2)
- Over 50% of respondents with T2DM, hypertension, and obesity saw only their primary care physician in the past 12 months

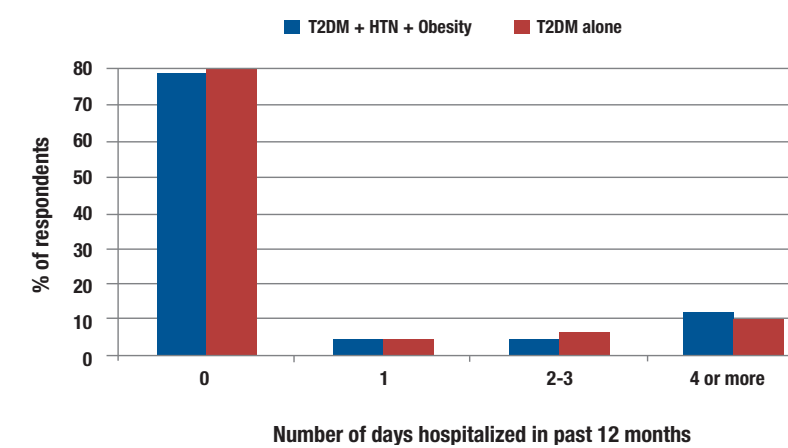
**Figure 3. Number of emergency room visits in the past 12 months**



\*p = 0.02

- Respondents with comorbid T2DM, hypertension, and obesity reported significantly more emergency room visits (mean = 1.9 vs. 1.4) than respondents with T2DM alone (p = 0.02) (Figure 3)
- More respondents with the triad conditions had 2 or more visits (9%, up to 13 visits) than respondents with T2DM alone (5%, up to 5 visits) (p = 0.02)

**Figure 4. Number of days hospitalized in the past 12 months**



- A similar proportion of respondents (20%) were hospitalized at least once in the past 12 months between groups (p > 0.05) (Figure 4)
- There was no significant difference in the number of days respondents were hospitalized between groups (p = 0.15)

## LIMITATIONS

- Healthcare resource utilization, diagnosis of diabetes and hypertension, and weight were self-reported and could not be validated with medical record review or administrative claims data. However, this bias is similar between the groups compared in this study
- 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

## SUMMARY

- Healthcare resource utilization was substantial among respondents with T2DM, hypertension, and obesity
- The number of physician visits and emergency room visits were significantly greater among respondents with the triad of conditions compared with respondents with T2DM alone
- These healthcare visits provide respondents with an opportunity for diabetes management as well as management of comorbid conditions
- Even though physician visits were frequent among respondents with the triad of conditions, less than 50% of these respondents saw a cardiologist or endocrinologist in the past 12 months

## CONCLUSIONS

- Respondents with comorbid conditions of T2DM, hypertension, and obesity had greater healthcare resource utilization in physician office visits and emergency room visits than those with T2DM alone

## REFERENCES

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## LIST OF ABBREVIATIONS

<b>BMI</b>	Body mass index
<b>CVD</b>	Cardiovascular disease
<b>HTN</b>	Hypertension
<b>PCP</b>	Primary care physician
<b>SHIELD</b>	Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes
<b>T2DM</b>	Type 2 diabetes mellitus

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