

Quality of Life and Depression 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^{1,2}
- Adults with type 2 diabetes mellitus are likely to have other health conditions that may adversely impact their health status and glycemic control^{3,4}
- Hypertension, obesity, cigarette smoking, and hyperlipidemia act as independent modifiable contributors to CVD in patients with diabetes⁵
- Current ADA and IDF standards of medical care aim to reduce the vascular complications through control of glycemia, blood pressure, and blood lipids^{6,7}
- Individuals with T2DM are known to have poorer quality of life and more depressive symptoms than those without diabetes, yet the impact may be in part due to comorbid conditions^{6,7}
- Little attention has been paid to characterizing individuals with T2DM and comorbid hypertension and obesity and understanding their quality of life, compared with individuals with T2DM alone

OBJECTIVE

- To compare quality of life and depression among adults with self-reported T2DM and comorbid HTN and obesity with adults reporting T2DM alone

METHODS

STUDY DESIGN

- Cross-sectional analysis among SHIELD respondents with T2DM with or without HTN and obesity
- Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes (SHIELD) is a 5-year population-based survey conducted to better understand the risk for the development of diabetes, as well as diabetes disease burden
 - Based upon a screening questionnaire mailed to 200,000 nationally representative households (TNS NFO Household Panel), responses for 211,097 adults from 127,420 households were obtained (64% response rate)
 - 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 from 14,921 SHIELD respondents (71% response rate) to identify those with the triad conditions (T2DM, HTN, obesity)

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 HTN and obesity
 - Those without a self-report of HTN and obesity
- Respondents reported a diagnosis of HTN based on being told by a healthcare professional that they had high blood pressure or HTN
- Obesity was defined as a BMI ≥ 30 kg/m²
- Respondents had to have a self-reported diagnosis of T2DM and HTN and BMI ≥ 30 kg/m² to be included in the triad condition group. Respondents with a self-reported diagnosis of T2DM and no self-reported diagnosis of HTN and BMI < 30 kg/m² were classified into the T2DM alone group

STUDY MEASURES

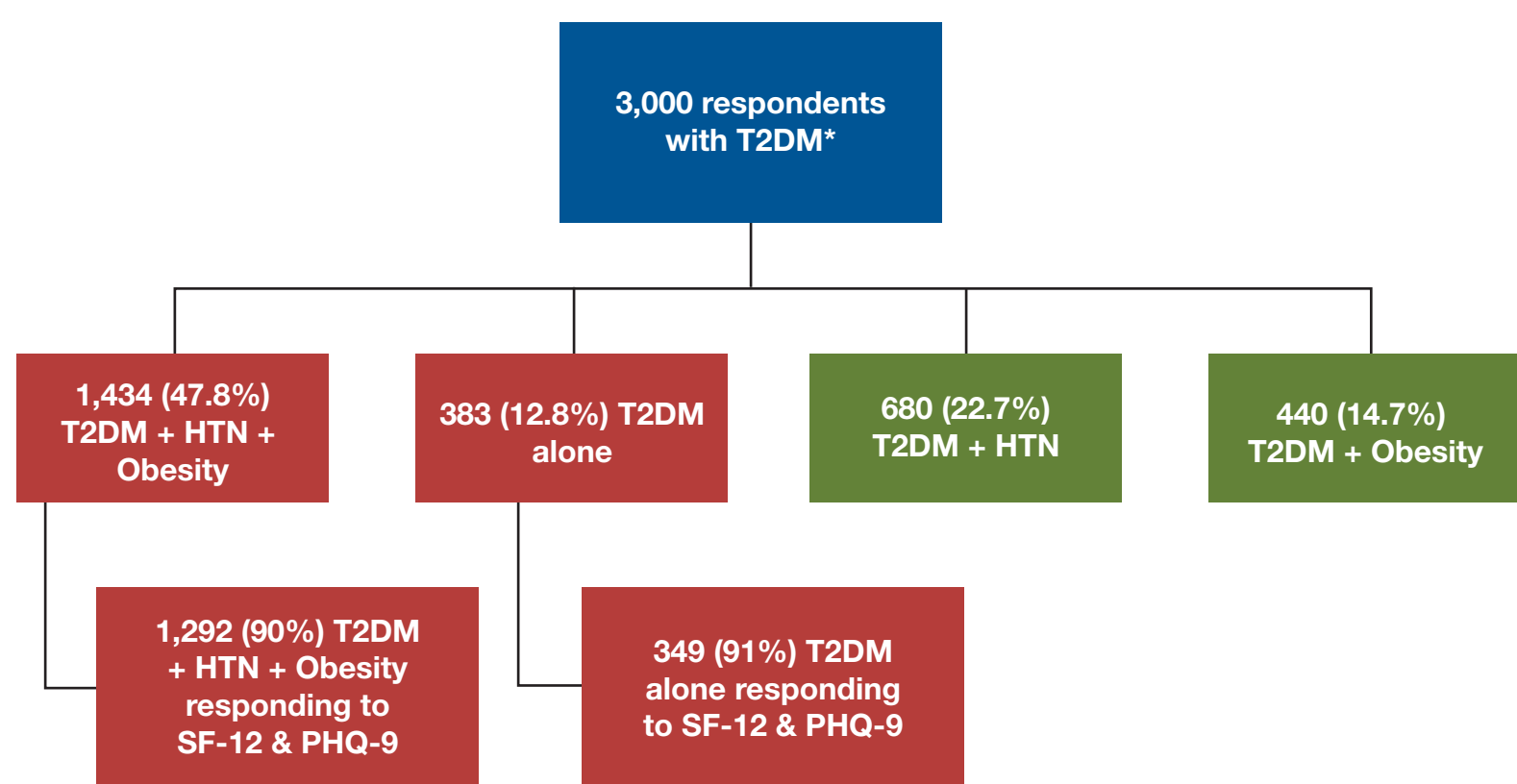
- HRQOL was assessed using the Short Form-12 (SF-12)
 - 12-item measure of overall health status with a recall period of 4 weeks
 - Scale ranges from 0–100, with norm-based scoring (population mean = 50) for PCS and MCS scores
 - Higher scores indicate better QOL
- Depression was assessed using the Patient Health Questionnaire (PHQ-9)
 - 9 signs and symptoms of depression from the DSM-IV
 - Higher scores indicate increasing severity of depression
 - Scores of 5–9 = minimal depression; 10–14 = minor depression; 15–19 = major depression, moderately severe; and ≥ 20 = major depression, severe
- Comorbid conditions were self-reported based on survey questions of being told by a healthcare professional that they had the condition

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

Figure 1. SHIELD respondents with T2DM and other comorbid conditions with responses to the SF-12 and PHQ-9



*63 respondents with T2DM did not provide complete responses to the survey and were not included in the analysis

- 1,292 respondents had T2DM and comorbid HTN and obesity and responded to the SF-12 and PHQ-9 questionnaires
- 349 respondents had T2DM alone and responded to the SF-12 and PHQ-9 questionnaires

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RESULTS (Continued)

Table 1. Characteristics of respondents with triad conditions versus T2DM alone

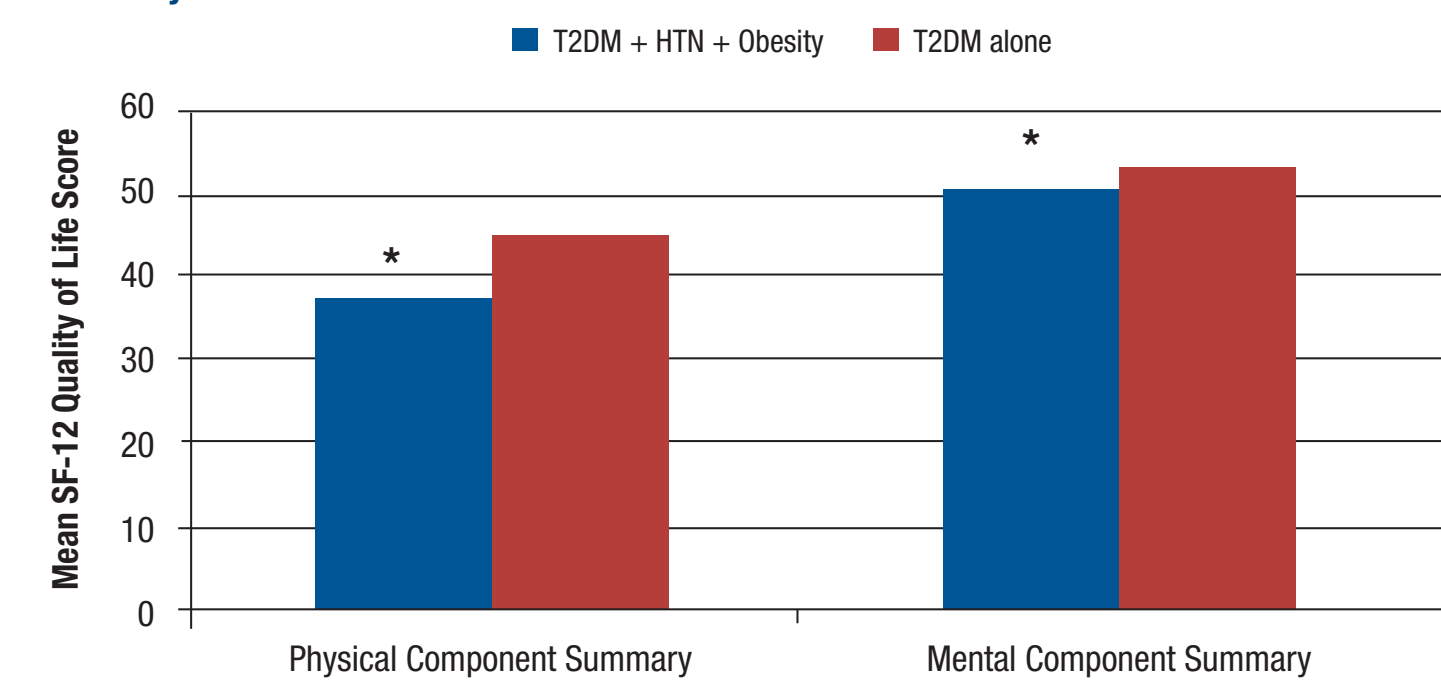
Characteristics	T2DM + HTN + Obesity (n = 1,292)	T2DM alone (n = 349)
Age, years, mean (SD)	61.4 (10.8)*	66.2 (12.9)
Men, %	34.7*	54.3
White, %	73.6	74.9
Education, % with < some college	34.8	33.4
Income, % with <\$30,000/year	39.5*	27.9
Dyslipidemia, %	79.4*	56.9
Heart disease/heart attack, %	24.4	19.8
Stroke/TIA, %	5.5	5.7
Total number of comorbid conditions (excluding T2DM, HTN, obesity), mean (SD)	6.6 (3.5)*	4.0 (3.1)
Currently smoke, %	13.3	16.3

* $p < 0.01$

- Respondents with the triad conditions were younger, more often women, and had lower household income and more comorbid conditions, such as dyslipidemia, than respondents with T2DM alone ($p < 0.01$) (Table 1)
- Respondents with the triad conditions were similar to respondents with T2DM alone in race, education, smoking status, and cardiovascular disease history

Health-related Quality of Life

Figure 2. SF-12 Physical and Mental Component scores for T2DM respondents with and without comorbid HTN and obesity

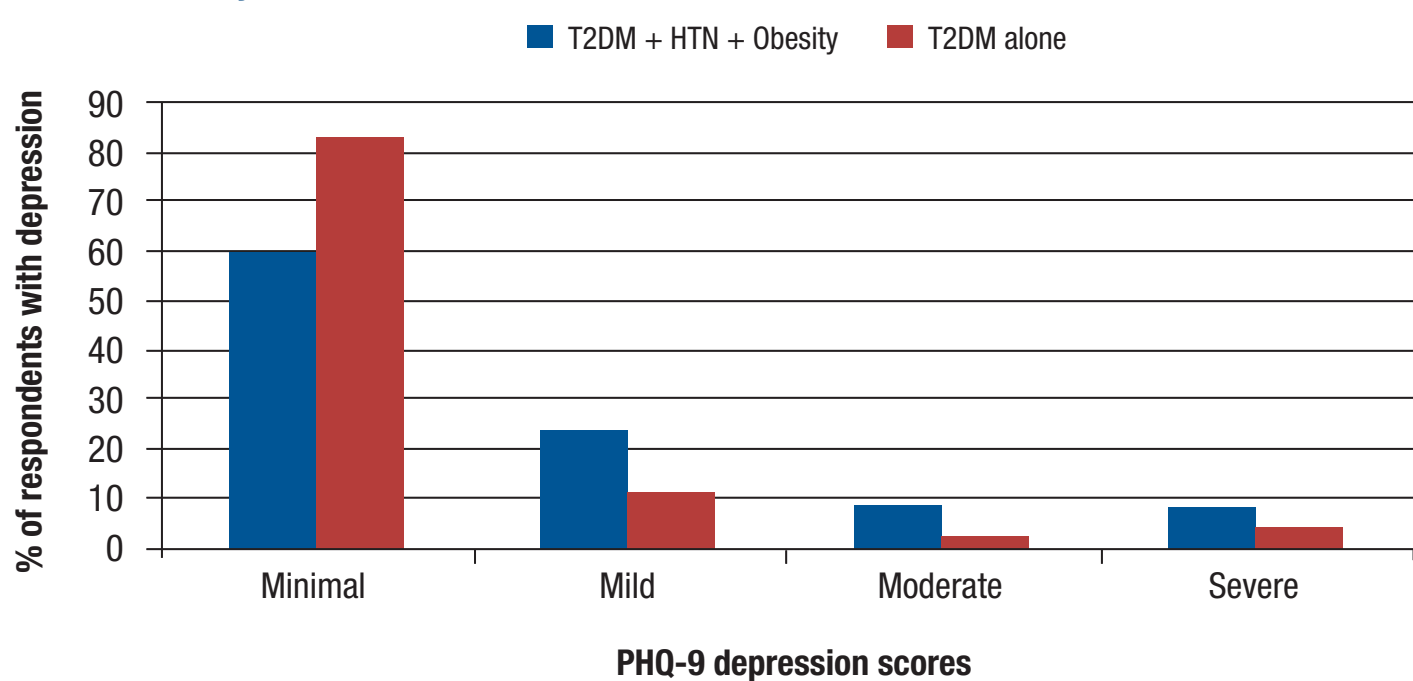


* $p < 0.001$

- Respondents with T2DM + HTN + obesity had significantly lower Physical and Mental Component Summary scores (37.3 and 50.9, respectively) than T2DM alone respondents (45.8 and 53.5, respectively) (Figure 2)

Depression

Figure 3. Patient Health Questionnaire scores for depression for T2DM respondents with and without comorbid HTN and obesity



$P < 0.001$ for comparison between triad group and T2DM alone group across the severity levels

- A significantly greater proportion of respondents with T2DM + HTN + obesity had mild to severe depression based on the PHQ-9 scores (Figure 3)
 - 16.5% of respondents with T2DM + HTN + obesity had moderate to severe depression, compared with 6.1% of respondents with T2DM alone ($p < 0.001$)
- Mean PHQ-9 scores were significantly higher among T2DM respondents with comorbid HTN and obesity (5.0 versus 2.5, $p < 0.001$) than among respondents with T2DM alone

LIMITATIONS

- Diagnosis of diabetes, HTN, other comorbid conditions or complications, 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

- SHIELD respondents with T2DM, HTN, and obesity reported lower quality of both physical and mental health than the T2DM alone group
- Respondents with T2DM, HTN, and obesity reported more depression symptoms and greater depression burden than respondents with T2DM alone
- Further research is needed to determine whether the poor quality of life and greater depression in the respondents with T2DM and comorbid HTN and obesity affect self-management of their diabetes and comorbid conditions

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LIST OF ABBREVIATIONS

ADA	American Diabetes Association	PCS	Physical Component Summary
BMI	Body mass index	PHQ-9	Patient Health Questionnaire-9 items
CVD	Cardiovascular disease	SHIELD	Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes
DSM IV	Diagnostic and Statistical Manual of Mental Disorders-IV	SF-12	Short Form-12 items
HRQOL	Health-related quality of life	T2DM	Type 2 diabetes mellitus
HTN	Hypertension	TIA	Transient ischemic attack
IDF	International Diabetes Federation	TNS NFO	Taylor Nelson Sofres National Family Opinion
MCS	Mental Component Summary		