Healthcare Resource Utilization and Pharmacy Out-of-Pocket Expenditures among SHIELD Respondents of Differing Cardiometabolic Risk

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BACKGROUND

- It is well documented that diabetes is a prevalent and costly disease[1,2]
- 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[3]
- Notwithstanding, little information is available on specific use of healthcare resources among individuals with diabetes or at risk for diabetes who are treated in the community
- Additionally, the impact of out-of-pocket expenditures for medical care on accessing and purchasing healthcare resources has not been well explored for individuals with or at risk for diabetes

OBJECTIVES

- Estimate the healthcare resource utilization among individuals with diabetes and those at risk for diabetes
- Evaluate the impact of out-of-pocket expenditures for medical care on accessing and purchasing healthcare resources

METHODS

Study Design

- Cross-sectional analysis of healthcare resource utilization among SHIELD respondents with or at risk for T2DM
- Data source was the **S**tudy 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 64-item survey was sent to 22,001 selected individuals derived from the screening respondents. Since 2004, sequential 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

Study Population

- Respondents were categorized as having T2DM or at risk for diabetes based on cardiometabolic risk factors
- Having T2DM was based upon self-report of having been "told by a doctor, nurse or other healthcare professional that you have type 2 diabetes"
- High risk for T2DM was defined as having at least 3 of the following self-reported cardiometabolic risk factors and low risk was defined as having ≤2 of these cardiometabolic risk factors
  - Abdominal obesity: waist circumference ≥97 cm for men, ≥89 cm for women
  - BMI ≥28 kg/m^2
  - Dyslipidemia
  - Hypertension
  - History of cardiovascular disease
- Three respondent groups were assessed: 1) T2DM, 2) high risk, and 3) low risk

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
  - Nursing home
  - Inpatient rehabilitation center
  - Emergency room or urgent care facility
  - Healthcare professional
- Medical tests or examinations done in the past 12 months were reported for:
  - Urinalysis/Urine test
  - Blood pressure measurement
  - Cholesterol blood test
  - Fasting blood glucose (sugar) test
- Self-reported total amount paid each month that is not covered by health insurance (out-of-pocket cost) for all prescription medications was collected
- To assess the impact of out-of-pocket expenditure, respondents were asked, "How often does the amount of your own money you have to pay (not covered by insurance) for healthcare services prevent you from …"
  - Visiting a physician, nurse, or other healthcare professional
  - Buying your prescription medication
  - Purchasing needed medical supplies
  - Having medical tests done

Statistical Analyses

- Comparisons across groups were conducted using ANOVA with post hoc SNK Tukey multiple comparisons test
- Ad hoc statistical testing (chi-square test for categorical variables and t-tests for continuous variables) was conducted to determine whether T2DM respondents were different from high-risk and low-risk respondents
- Statistical significance was set a priori as p<0.05

RESULTS

Three respondent groups were included in the analysis: T2DM (n=2916), High risk (n=4082), and Low risk (n=4059)

Table 1. Characteristics of SHIELD respondents

Characteristics	Type 2 diabetes (n=2916)	High risk (n=4082)	Low risk (n=4059)
Age, years, mean (SD)	59.8 (13.0)*	58.3 (14.5)	46.5 (16.2)
Women, %	57.5*	56.9	66.2
Whites, %	85.1*	88.3	88.7
Education, % with at least some college	65.0*	68.5	75.4
Income, % with household income ≥$40,000/year	48.5*	54.2	64.2
Geographic region, %			
Northeast	19.0	19.6	18.5
North Central	24.1*	26.2	26.5
South Atlantic	21.4	19.6	17.4
South Central	17.6	17.2	17.1
Mountain	5.3	5.8	7.0
Pacific	12.6	11.6	13.5

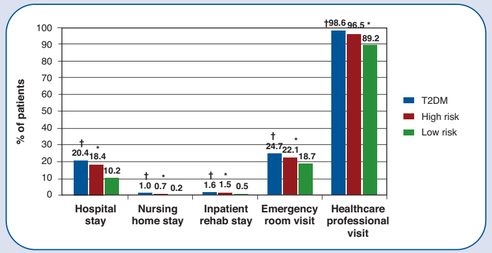
*ANOVA p <0.001 for comparison across all 3 groups

- There was a significantly higher proportion of respondents who were men, non-white, older, less educated, and had lower household income in the T2DM group compared with high- or low-risk respondents (p<0.001)

RESULTS

Healthcare Resource Utilization

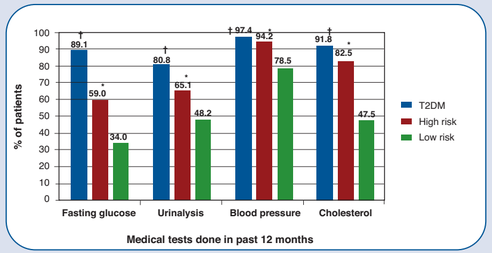
Figure 1. Percentage of SHIELD respondents with ≥ 1 visit in the past 12 months



*p<0.0001 for high risk vs. low risk; †p<0.0001 for T2DM vs. low risk

- T2DM respondents had substantial use of healthcare resources; 20% were hospitalized, with an average length of stay of 7.5 days
- High-risk respondents had similar healthcare resource utilization as T2DM respondents; 18% were hospitalized, with average length of stay of 6 days
- Low-risk respondents reported significantly lower healthcare resource utilization, compared with T2DM and high-risk respondents (p<0.0001)
- T2DM respondents had an average of 12 visits to healthcare professionals in the past 12 months, and high-risk respondents had an average of 10 visits

Figure 2. Percentage of SHIELD respondents who had a medical test in the past 12 months

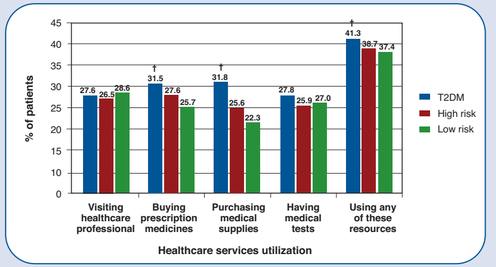


*p<0.0001 for high risk vs. low risk; †p<0.0001 for T2DM vs. low risk

- Majority of T2DM respondents had routine medical testing done in the past 12 months
- Large percentage of high-risk respondents also had blood pressure and cholesterol testing (>82%) and 59% had a fasting glucose test
- Significantly fewer low-risk respondents had a fasting glucose, urinalysis, blood pressure, or cholesterol test, compared with T2DM and high-risk respondents (p<0.0001)

IMPACT OF OUT-OF-POCKET EXPENDITURE

Figure 3. Percentage of SHIELD respondents who reported out-of-pocket expenses prevented utilization of healthcare services



†p<0.0001 for T2DM vs. low risk

- Average monthly out-of-pocket expenditure for prescription medications was significantly higher for T2DM ($108) and high-risk ($92) respondents, compared with low-risk respondents ($52) (p<0.0001)
- Approximately one third of all respondents indicated that out-of-pocket expenses for healthcare services prevented them from utilizing healthcare resources
- More T2DM respondents reported that out-of-pocket expenses prevented them from utilizing healthcare resources than low-risk respondents (p<0.0001)

LIMITATIONS

- Healthcare resource utilization and out-of-pocket expenditures were self-reported and could not be validated with medical record review or administrative claims data. However, this bias is similar across 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 T2DM and high-risk respondents
- T2DM and high-risk respondents were seeking healthcare for their diabetes and other risk factors, with an average of 10-12 visits in the past 12 months
- These healthcare visits provide respondents with an opportunity for preventive care and diabetes management, yet 20% of T2DM respondents reported a hospitalization and 25% reported an emergency room visit in the past 12 months
- T2DM respondents also reported high monthly out-of-pocket expenditure for prescription medications
- One third of respondents reported that out-of-pocket expenditure was a barrier to utilizing healthcare resources
- It is noteworthy that high-risk respondents had substantial healthcare resource utilization and monthly out-of-pocket expenditure for prescription medications, similar to T2DM, even though they did not have a diagnosis of diabetes

CONCLUSIONS

- T2DM and high-risk respondents reported substantial healthcare resource utilization, which could provide an opportunity for preventive care and disease management by healthcare professionals
- In contrast, the high healthcare resource utilization may indicate that some respondents may not be managing their disease well. Failing to seek preventive care because of out-of-pocket expenditures could further compound the disease burden for the T2DM respondents and hasten the progression to diabetes for the high-risk respondents

References

1. King H, et al. *Diabetes Care* 1998; 21:1414-1431
2. Senemmari B. *Caring* 2005; 24:6-12
3. Hogan P, et al. *Diabetes Care* 2003; 26:917-932

List of Abbreviations

ANOVA	Analysis of variance
SHIELD	Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes
T2DM	Type 2 diabetes mellitus

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