Diabetes Medication Satisfaction Tool

A focus on treatment regimens

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OBJECTIVE — To develop and test a patient questionnaire on treatment satisfaction with diabetes regimens.

RESEARCH DESIGN AND METHODS — Survey items were developed from community clinic focus groups, pretested in patients with diabetes, and examined in two samples of treated patients.

RESULTS — Sixteen items performed well in assessing treatment experiences: ease and convenience, lifestyle burdens, well-being, and medical control. Construct validity was supported by associations (P < 0.05) with treatment complexity, self-rated glucose control, health worries, and A1C. Internal consistency ranged from 0.89 to 0.95.

CONCLUSIONS — The Diabetes Medication Satisfaction Tool offers a comprehensive assessment of patient acceptability, with diabetes therapy useful for individualizing therapeutic decision making.

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Received 3 July 2008 and accepted 26 September 2008.

Published ahead of print at http://care.diabetesjournals.org on 17 October 2008. DOI: 10.2337/dc08-0856.

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**Table 1—Final model of known groups validity**

|                           | Treatment complexity | Self-rated glucose control | Perceived general health | A1C |
|---------------------------|----------------------|----------------------------|--------------------------|-----|
|                           | High (n)             | Low                        | Good                     | Poor | High | Low | >8% | <8% |
| **DMSAT§**                |                      |                            |                          |      |      |     |     |     |
| Lifestyle                 | 5                    | 59.8                       | 70.9§                    | 76.2| 63.3 | 79.8| 62.3#| 61.4| 69.0 |
| Convenience               | 3                    | 68.4                       | 77.7                     | 82.6| 71.1 | 84.3| 70.7| 68.2| 76.6 |
| Glucose control           | 5                    | 50.4                       | 61.4                     | 74.1| 51.0 | 68.1| 53.9| 47.2| 61.3#|
| Well-being                | 3                    | 55.1                       | 64.7                     | 75.2| 55.9 | 76.9| 55.5| 53.2| 64.2#|
| Total score               | 16                   | 59.9                       | 70.1†                    | 77.6| 62.1 | 78.4| 62.0#| 59.3| 69.0#|
| **DTSQ (n = 92)**         | 8                    | 25.9                       | 28.2                     | 30.3| 26.2 | 30.9| 26.1#| 25.6| 28.0 |

Data are scores means unless otherwise indicated. *High: score of 3+; low: score of 0–2. †Good: excellent or very good score; poor: good, fair, or poor score. ‡High: excellent or very good score; poor: good, fair, or poor score. §Lower scores indicate less treatment satisfaction. \( P < 0.05 \) \( \varphi P < 0.01 \). \#P < 0.001.

(EFA) of the DMSAT items was conducted using SAS (version 8; SAS, Cary, NC) to assess whether the common factor model was appropriate (14) based on Kaiser’s sampling adequacy, Scree plot, and model fit. An oblique rotation of the initial factor solution was performed to allow correlated factors. Discriminant validity of the DMSAT was examined by comparing means across levels of A1C (<8% and ≥8%), treatment complexity (low and high), self-reported adherence, and MOS health worries.

For the final test sample, another sample of patients from our community diabetes care clinics (11) and from an academic medical center was recruited to conduct and evaluate confirmatory factor analysis of the DMSAT and confirm validity. Internal consistency reliability of the DMSAT scales and total score was also assessed.

**RESULTS** — In the evaluation sample, 194 (63%) of 307 eligible patients returned the survey packet; of these, 140 reported current medication use. Participants had a mean age of 63 years, and most had completed high school (77%) and had been diagnosed with diabetes at least 5 years previously (61%). One-third (29–39%) were taking one, two, or three medications for diabetes, with 16% taking insulin; 14% had a recent A1C >8.0%, and 19% rated their adherence to their medication regimen in the last 10 days as less than complete. Ten items displayed high inter-item correlations (>0.75) and were removed. Initial factor analysis of the reduced 16-item questionnaire identified a four-factor structure consistent with our domains of lifestyle, medical control, convenience, and well-being and explained 75% of the total variance. Kaiser’s measure (0.92) suggested a common-factor model. Reliability estimates of the four DMSAT scales and total score were 0.89 to 0.95. Percentcs at the ceiling of the scales were low (1.45–6.62%). As shown in Table 1, DMSAT scales and total score discriminated (\( P < 0.05 \)) between high and low levels of treatment complexity, self-rated glucose control, MOS Health Worries Scale score, and clinical value for recent A1C (<8% vs. ≥8%) in the expected direction. Correlation of the DMSAT scores with continuous A1C values was \(-0.24 (P = 0.0049)\). In the final, confirmatory sample, the DMSAT instrument and survey packet were obtained from 92 patients. Confirmatory factor analysis closely replicated the earlier 16-item structure (not shown). As shown in Table 1, DMSAT scales and total scores discriminated between validity groups as in the previous sample and were highly correlated with the DTSQ (\( r = 0.68; P < 0.001 \)). Unlike the DMSAT, the DTSQ total score did not discriminate between levels of treatment complexity and clinical A1C value.

**CONCLUSIONS** — The DMSAT is intended as a brief measure of diabetes medication treatment satisfaction and discriminates between important correlates of patient management. It performed as well as the DTSQ in detecting self-rated glucose control and health worries but showed superior properties in correspondence with treatment complexity and A1C. Note that appraisals of cost of medications or specific side effects that may be caused by diabetes or its treatment, such as diminished sexual functioning, bloating, or weight gain, are not separately assessed and may require assessment elsewhere. Longitudinal data are needed to examine responsiveness to interventions. In summary, we believe that the 16-item DMSAT offers a comprehensive assessment of satisfaction with diabetes therapy and may aid in individualizing patient diabetes treatment.

**Acknowledgements** — This study was funded by a grant to the Wake Forest University School of Medicine by Merck Inc, West Point, Pennsylvania. C.J.G. is employed by Merck and holds stock in Merck, Amgen, and Genentech. C.D. was employed by Merck during this work. No other potential conflicts of interest relevant to this article were reported.

DTSQ data for results in Table 1 are used with the permission of C. Bradley, Department of Psychology, Royal Holloway, University of London Egham, Surrey, U.K.

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