

Diabetes Self-Management Questionnaire (DSMQ)

Schmitt, A. (2012)

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Relevant publications:

- 1) Schmitt A, Gahr A, Hermanns N, Kulzer B, Huber J, Haak T. The Diabetes Self-Management Questionnaire (DSMQ): development and evaluation of an instrument to assess diabetes self-care activities associated with glycaemic control. Health and Quality of Life Outcomes 2013; 11: 138. <http://www.hqlo.com/content/11/1/138>
- 2) Schmitt A, Gahr A, Hermanns N, Kulzer B, Huber J, Haak T. The Diabetes Self-Management Questionnaire (DSMQ): Evaluation of an instrument to assess diabetes self-care activities associated with glycaemic control. [Abstract] Book of Abstracts of the 18th Scientific Meeting of the PSAD Study Group 2013. http://uvtapp.uvt.nl/fsw/spits.ws.frmShowpage?v_page_id=7912392764109321
- 3) Schmitt A, Gahr A, Hermanns N, Kulzer B, Haak T. [The Diabetes Self-Management Questionnaire (DSMQ): Psychometric Analysis of a new questionnaire on the quality of diabetes self-care] [in German]. Diabetol Stoffwechsel 2013; 8 (S01) S13. DOI: 10.1055/s-0033-1341698, <https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-0033-1341698>
- 4) Schmitt A, Reimer A, Hermanns N, Schall S, Haak T, Kulzer B. [The Diabetes Self-Management Questionnaire (DSMQ) identifies diabetes patients at high risk of a negative prognosis] [in German]. Diabetol Stoffwechsel 2014; 9: S84. DOI: 10.1055/s-0034-1375158, <https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-0034-1375158>
- 5) Schall S, Schmitt A, Hermanns N, Queri S, Kulzer B, Haak T. [Consistency of self-reported diabetes self-management with clinical/medical outcome measures] [in German]. Diabetol Stoffwechsel 2014; 9: S48-S49. DOI: 10.1055/s-0034-1375026, <https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-0034-1375026>
- 6) Schmitt A, Hermanns N, Kulzer B, Reimer A, Schall S, Haak T. The Diabetes Self-Management Questionnaire (DSMQ) can detect inadequate self-care behaviour and help identify patients at risk of a negative diabetes prognosis (abstract). Diabetologia 2014;57(Suppl.1):S1-S564. <http://www.easdvirtualmeeting.org/resources/17872> (Poster: <http://www.easdvirtualmeeting.org/resources/18987>)
- 7) Schmitt A, Reimer A, Kulzer B, Huber J, Ehrmann D, Schall S, Hermanns N. Assessing diabetes self-care with the Diabetes Self-Management Questionnaire (DSMQ) can facilitate the identification of patients with suboptimal metabolic control due to self-care practices in need of improvement. Submitted for publication, 2015.

Scoring guide

Scale structure (16-item version)

- a) 'Sum Scale' (SS) as a global measure of the quality of diabetes self-care. It comprises all 16 items (item 16 is included only in the Sum Scale). Items to be inverted: 5, 7, 10, 11, 12, 13, 14, 15, 16.
- b) 4 Subscales:
 - 'Glucose Management' (GM), items 1, 4, 6, 10, 12 (10 and 12 must be inverted)
 - 'Dietary Control' (DC), items 2, 5, 9, 13 (5 and 13 must be inverted)
 - 'Physical Activity' (PA), items 8, 11, 15 (11 and 15 must be inverted)
 - 'Health-Care Use' (HU), items 3, 7, 14 (7 and 14 must be inverted)

Additional information for the DSMQ-R (20 + 7 items) is provided on page 4.

Item scoring

4-point Likert scale

'Applies to me very much' = 3 points

'Applies to me to a considerable degree' = 2 points

'Applies to me to some degree' = 1 point

'Does not apply to me' = 0 points

If '...is not required as a part of my treatment' is stated in an item, that item should not be scored.

Scale scoring (16-items version):

The DSMQ contains 7 positively and 9 negatively (resp. inversely) worded items (with view to effective self-care). The inverse items have to be recoded such that higher values indicate more effective self-care before summing item scores to scale scores.

Example:

Item 16: *I could improve my diabetes self-care considerably.*

Raw scores	Inverse scores to be summed
'Applies to me very much' = 3 points	= 0 points
'Applies to me to a considerable degree' = 2 points	= 1 point
'Applies to me to some degree' = 1 point	= 2 points
'Does not apply to me' = 0 points	= 3 points

Based on recoded item scores the scale scores are computed as follows:

$$\text{SCALE SCORE} = \text{ACTUAL SUM OF ITEMS} / \text{MAXIMUM POSSIBLE SUM OF ITEMS} \times 10$$

Thus, the transformed scale score can vary between 0 and 10.

If an item was skipped, the numerator should be corrected by -3.

Examples (16-items version):

'Glucose Management' (if all five items were answered):

14 (exemplary sum) / 15 (maximum possible sum of 5 Items) x 10 = 9.3 points

'Dietary Control' (if all four items were answered):

8 (exemplary sum) / 12 (maximum possible sum of 4 Items) x 10 = 6.7 points

'Physical Activity' (if all three items were answered):

5 (exemplary sum) / 9 (maximum possible sum of 3 Items) x 10 = 5.6 points

'Health-Care Use' (if all three items were answered):

9 (exemplary sum) / 9 (maximum possible sum of 3 Items) x 10 = 10 points

'Sum Scale' if all sixteen items were answered:

37 (exemplary sum) / 48 (maximum possible sum of 16 Items) x 10 = 7.7 points

if two items were skipped:

30 (exemplary sum) / 42 (maximum possible sum of 14 Items) x 10 = 7.1 points

Normal values (16-items version):

DSMQ-scores of people with Type 1 or Type 2 diabetes, distinguished by HbA_{1c}-value:

	Total sample	HbA _{1c} ≤ 7.5%	HbA _{1c} ≥ 7.6 ≤ 8.9%	HbA _{1c} ≥ 9.0%	P-value
T1DM (N = 344)	GM: 7.1 ± 2.6	GM: 8.5 ± 1.7	GM: 7.3 ± 2.3	GM: 5.6 ± 2.8	0.000
	DC: 4.8 ± 2.4	DC: 6.2 ± 1.9	DC: 4.7 ± 2.3	DC: 3.9 ± 2.4	0.000
	PA: 6.2 ± 2.5	PA: 6.8 ± 2.4	PA: 6.1 ± 2.4	PA: 6.0 ± 2.6	0.030
	HU: 8.2 ± 2.1	HU: 8.6 ± 1.8	HU: 8.4 ± 2.1	HU: 7.6 ± 2.5	0.001
	SS: 6.5 ± 1.9	SS: 7.6 ± 1.3	SS: 6.6 ± 1.6	SS: 5.5 ± 2.0	0.000
T2DM (N = 230)	GM: 7.5 ± 2.3	GM: 8.6 ± 1.6	GM: 7.8 ± 2.1	GM: 6.6 ± 2.4	0.000
	DC: 5.4 ± 2.4	DC: 6.5 ± 2.1	DC: 5.7 ± 2.3	DC: 4.4 ± 2.3	0.000
	PA: 4.9 ± 2.7	PA: 5.9 ± 3.0	PA: 4.8 ± 2.5	PA: 4.3 ± 2.5	0.002
	HU: 8.0 ± 2.1	HU: 8.7 ± 1.9	HU: 8.0 ± 1.9	HU: 7.5 ± 2.2	0.003
	SS: 6.5 ± 1.7	SS: 7.5 ± 1.3	SS: 6.6 ± 1.4	SS: 5.7 ± 1.7	0.000

On the basis of these data, a preliminary cut-off score ≤ 6.0 (total score) to facilitate the identification of suboptimal self-care is proposed.

Scoring of the DSMQ-R (2015)

(20 items + 7 optional items for insulin-treated patients)

Scales:

For non-insulin-treated patients (items 1 – 20):

Sum Scale (SS): all 20 items (item 16 and 20 are included in the Sum Scale only);
items to be inverted: 5, 7, 10, 11, 12, 13, 14, 15, 16, 18.

4 Subscales:

- 'Glucose Management' (GM), 5 items: 1, 4, 6, 10, 12 (10 and 12 must be inverted).
- 'Dietary Control' (DC), 6 items: 2, 5, 9, 13, 17, 18 (5, 13 and 18 must be inverted).
- 'Physical Activity' (PA), 3 items: 8, 11, 15 (11 and 15 must be inverted).
- 'Health-Care Use' (HU), 4 items: 3, 7, 14, 19 (7 and 14 must be inverted).

For insulin-treated patients (items 1 – 27):

'Sum Scale' (SS): all 27 items (item 16 and 20 are included in the Sum Scale only);
items to be inverted: 5, 7, 10, 11, 12, 13, 14, 15, 16, 18.

4 Subscales:

- 'Glucose Management' (GM), 11 items: 1, 4, 6, 10, 12, 21, 22, 23, 24, 26, 27 (10 and 12 must be inverted).
- 'Dietary Control' (DC), 7 items: 2, 5, 9, 13, 17, 18, 25 (5, 13 and 18 must be inverted).
- 'Physical Activity' (PA), 3 items: 8, 11, 15 (11 and 15 must be inverted).
- 'Health-Care Use' (HU), 4 items: 3, 7, 14, 19 (7 and 14 must be inverted).

Item and scale scoring is done analogously to the 16-item version (see page 2).

The DSMQ-R contains 10 positively and 10 negatively (resp. inversely) worded items (with view to effective self-care); the full form including 20 items + 7 items for insulin-treated patients contains 17 positively and 10 negatively (resp. inversely) worded items. The inverse items have to be recoded such that higher values indicate more effective self-care before summing item scores to scale scores.

Based on recoded item scores the scale scores are computed as follows:

$$\text{SCALE SCORE} = \text{ACTUAL SUM OF ITEMS} / \text{MAXIMUM POSSIBLE SUM OF ITEMS} \times 10$$

Thus, the transformed scale score can vary between 0 and 10.

If an item was skipped, the numerator should be corrected by -3.