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The Diabetes Health Profile

6 Key References

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Introduction

As with other diseases there has been over the past two decades a significant shift in focus from the biochemical and physical measurement such as blood glucose levels in the care and treatment of the patient with diabetes to one of self-report by the patient as to their perceptions of the illness and outcomes from treatment.

The Diabetes Health Profile (DHP), first published in 1996 (Meadows *et al* 1996), was one of the first diabetes-specific patient reported outcome (PRO) measures developed to assess the psychological and behavioural outcomes as a result of living with diabetes. The DHP was developed with significant patient and clinical input to represent a model of patient reported outcomes not previously included in other diabetes-specific instruments, such as the disinhibited eating domain.

Sanctioned by the UK Department of Health their for their Long Term Condition Patient reported outcome measures (PROMS) Programme the DHP has been extensively administered across a range of settings including clinical trials, academic research and population and community surveys to more than 10.000 people with either Type 1 or Type 2 diabetes, where it has demonstrated sound psychometric properties and operational performance as well as being highly acceptable to patients.

Available in 30 languages, use of the DHP is supported by a comprehensive user manual and a norm-referenced data set together with information on the minimal important difference (MID). Two diabetes-specific preference-based measures that, subject to psychometric assessment, have been developed to provide condition-specific utility values to complement generic utilities from more widely validated measures such as the EuroQol-5 Dimension.

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The Diabetes Health Profile (DHP): a new instrument for assessing the psychosocial profile of insulin requiring patients--development and psychometric evaluation

Meadows K, Steen N, McColl E, Eccles M, Shiels C,Hewison J, Hutchinson A

Abstract

The aim of the studies was to evaluate the psychometric properties and construct validity of the Diabetes Health Profile (DHP-1). Content for the DHP-1 was derived following in-depth interviews with 25 insulin dependent and insulin requiring patients, a review of the literature and discussions with health care professionals. Initial analysis of the factor structure of the DHP-1 was carried out on the responses of 239 insulin dependent and insulin requiring patients, with a mean age of 40.85 years (SD = 13.0), resulting in a 43 item three factor solution. The 43 item version of the DHP-1 was completed by 2,239 insulin dependent/requiring patients (mean age = 39.8, SD = 10) years. Fifty-one per cent were men. A forced three factor Principal Factoring Analysis with varimax rotation was carried out. Eleven items were excluded with item factor cross loadings > 0.30 or item factor loadings < 0.30. PAF analysis of the 32 items resulted in a three factor solution accounting for 33% of the total explained variance. The three factors were interpreted as Psychological Distress, Barriers to Activity and Disinhibited Eating. Factor congruence between subsamples were: Psychological distress (0.93), Barriers to Activity (0.93) and Disinhibited Eating (0.99). Coefficients of congruence between men and women were 0.94, 0.92 and 0.99 for Psychological Distress, Barriers to Activity and Disinhibited Eating respectively. Internal consistency of the three factors (Cronbach's alpha) were: Psychological Distress (0.86), Barriers to Activity (0.82), and Disinhibited Eating (0.77). Construct-convergent validity was investigated on a sample of 233 insulin dependent and insulin requiring patients (mean age = 51.46 years). Psychological Distress and Barriers to Activity subscales correlated with the Hospital Depression and Anxiety Scale = 0.50 to 0.62, $p < 0.01$) and subscales of the SF-36 (range: $r = -0.17$ to -0.62, $p < 0.01$). These findings lend support to the construct validity and reliability of the DHP-1 and that it is suitable for further development.

Qual Life Res. 1996 Apr;5(2):242-54.

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Adaptation of the Diabetes Health Profile (DHP-1) for use with patients with Type 2 diabetes mellitus: psychometric evaluation and cross-cultural comparison

Meadows KA, Abrams C, Sandbaek A.

AIMS: To adapt the Diabetes Health Profile (DHP-1) for use with English speaking patients with Type 2 diabetes mellitus and to evaluate the psychometric properties of the adapted measure in a UK and Danish sample of insulin, tablet and diet-treated patients with Type 2 diabetes.

METHODS: Following linguistic adaptation using the forward-backward translation procedure, the 32-item DHP-1 was sent to 650 and 800 consecutively selected UK and Danish patients with Type 2 diabetes. Construct validity was assessed using principal axis factoring. Factor stability was assessed across language groups using the coefficient of congruence. Reliability was evaluated using Cronbach's alpha and multi-trait analysis, including item convergent/discriminant validity. Subscale discriminant validity was assessed through known groups with one-way ANOVA and post hoc Scheffe tests for multiple comparisons.

RESULTS: Eighteen items (56.25%) were retained following initial item analysis. A three-factor solution accounting for 45.6% and 40.3% of the total explained variance was identified in the UK and Danish samples, respectively. Factors were interpreted as psychological distress (PD), barriers to activity (BA) and disinhibited eating (DE). Factor congruence between language groups ranged from 0.98 to 0.99 and Cronbach's alpha ranged between 0.70 and 0.88. Item scaling success for both language versions was 88.9%. BA scores discriminated between treatment groups in both language groups ($F = 24.24$, $P < 0.001$; $F = 7.68$, $P < 0.001$) and PD scores in the UK sample ($F = 20.97$, $P < 0.001$).

CONCLUSIONS: The DHP-18 developed for use with patients with Type 2 diabetes has been shown to have satisfactory internal reliability and validity and measurement equivalence across language groups.

Diabet Med. 2000 Aug;17(8):572-80.

The construct validity and responsiveness of the EQ-5D, SF-6D and Diabetes Health Profile-18 in type 2 diabetes.

Mulhern B, Meadows K

BACKGROUND: Interest in the measurement of health related quality of life and psychosocial functioning from the patient's perspective in diabetes mellitus has grown in recent years. The aim of this study is to investigate the psychometric performance of and agreement between the generic EQ-5D and SF-6D and diabetes specific DHP-18 in Type 2 diabetes. This will support the future use of the measures by providing further evidence regarding their psychometric properties and the conceptual overlap between the instruments. The results will inform whether the measures can be used with confidence alongside each other to provide a more holistic profile of people with Type 2 diabetes.

METHODS: A large longitudinal dataset (n = 1,184) of people with Type 2 diabetes was used for the analysis. Convergent validity was tested by examining correlations between the measures. Known group validity was tested across a range of clinical and diabetes severity indicators using ANOVA and effect size statistics. Agreement was examined using Bland-Altman plots. Responsiveness was tested by examining floor and ceiling effects and standardised response means.

RESULTS: Correlations between the measures indicates that there is overlap in the constructs assessed (with correlations between 0.1 and 0.7 reported), but there is some level of divergence between the generic and condition specific instruments. Known group validity was generally good but was not consistent across all indicators included (with effect sizes from 0 to 0.74 reported). The EQ-5D and SF-6D displayed a high level of agreement, but there was some disagreement between the generic measures and the DHP-18 dimensions across the severity range. Responsiveness was higher in those who self-reported change in health (SRMs between 0.06 and 0.25).

CONCLUSIONS: The psychometric assessment of the relationship between the EQ-5D, SF-6D and DHP-18 shows that all have a level of validity for use in Type 2 diabetes. This suggests that the measures can be used alongside each other to provide a more holistic assessment of with the quality of life impacts of Type 2 diabetes.

Health Qual Life Outcomes. 2014 Mar 24;12:42. doi: 10.1186/1477-7525-12-42.

Investigating the minimally important difference of the Diabetes Health Profile (DHP-18) and the EQ-5D and SF-6D in a UK diabetes mellitus population

Brendan Mulhern, Keith Meadows

OBECTIVES: It is important to know what patient reported outcome measure (PROM) scores relate to a meaningful change in health status across time. The aim of this study was to investigate the minimally important difference (MID) of the Diabetes Health Profile (DHP-18), EQ-5D and SF-6D in a Type 1 and Type 2 diabetes patient sample.

METHODS: A longitudinal dataset including a UK community sample of people with Type 1 and Type 2 diabetes was used for the analysis. A combination of anchor and distribution methods was used to investigate the MID. For the anchor based method, a global health change indicator was used if it correlated with the PROM scores at baseline and follow up. To calculate the anchor based MID, the change in PROM score for those reporting no change on the anchor was subtracted from those reporting small change. For the distribution based estimation, the 1 Standard Error of Measurement, 0.5 and 0.33 standard deviation methods were used.

RESULTS: The anchor was not correlated with the DHP-18 dimensions so was only used to estimate MID values for the EQ-5D and SF-6D. For the DHP-18, MID estimates for the Psychological Distress domain range from 6.99 to 10.59, the Barriers to Activity domain range from 6.48 to 9.89, and the Disinhibited Eating domain range from 7.52 to 11.39. The EQ-5D estimations range from 0.058 to 0.158, and the SF-6D estimations range from 0.038 to 0.081. The 0.5 SD and 1SEM estimations are of a similar magnitude across the three measures.

CONCLUSIONS: This study has derived a range of values for each measure that may correspond to an important change in health status. The MID values may guide researchers who are using the measures as part of their assessment of both Type 1 and Type 2 patients with diabetes mellitus.

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The Psychometric Performance of the EQ-5D, SF-6D and Diabetes Health Profile (DHP-18) in Type 2 Diabetes

Mulhern B, Meadows K

OBJECTIVES: Generic preference-based measures such as EQ-5D and SF-6D and condition specific measures such as the Diabetes Health Profile-18 (DHP-18) are used in the assessment of health related quality of life in diabetes. The aim of this study was to investigate the psychometric acceptability, validity and responsiveness of these measures in a type 2 diabetes population.

METHODS: Acceptability was assessed by calculating missing data rates. We investigated the convergent validity of the measures using correlations, known group validity across a variety of clinical indicators using ANOVA, and agreement between the measures using Intra Class Correlation coefficients (ICC) and Bland Altman plots. Responsiveness to change over time was assessed using standardised response mean, and floor/ceiling effect tests. A UK longitudinal sample of 1613 people with Type 2 diabetes was used for the analysis.

RESULTS: Overall rates of missing data were less than 5% indicating acceptability to respondents. Across both time points, the DHP-18 dimensions were moderately correlated with the EQ-5D and SF-6D indicating construct validity. All three measures significantly discriminated between those reporting and not reporting co-morbid health problems. In terms of agreement, the ICC between the preference based measures was high, and Bland Altman plots indicated that agreement is higher at the less severe end of the scale. The EQ-5D displays evidence of a ceiling effect, and for patients self reporting change in health, SRM statistics indicate that the sensitivity to change across time is low for all measures.

CONCLUSIONS: There is evidence for the psychometric validity of the generic preference based measures EQ-5D and SF-6D and the condition specific DHP-18 to measure outcomes in diabetes. However evidence for the responsiveness of the measures is less clear. The inclusion of both generic and condition specific measures in trials may increase the accuracy of outcomes assessment in type 2 diabetes.

Value in Health Volume 15, Issue 7, November 2012, Page A50

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Developing preference-based measures for diabetes: DHP-3D and DHP-5D

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AIMS: The aim of this study was to develop two diabetes-specific preference-based measures [the Diabetes Health Profile–3 Dimension (DHP-3D) and the Diabetes Health Profile–5 Dimension (DHP-5D)] for use in the calculation of Quality Adjusted Life Years, a key outcome in economic evaluation. These measures were based on the non-preference-based instrument the Diabetes Health Profile.

METHODS: For DHP-3D, psychometric and Rasch analyses were used to develop a health state classification system based on the Diabetes Health Profile–18 (DHP-18). The DHP-5D added two dimensions to the DHP-3D to extend the range of impacts measured. Each classification system was valued by 150 general public respondents in the United Kingdom using Time Trade Off (TTO). Multivariate regression was used to estimate utility value sets. The matched dimensions across each measure were compared using *z*-score tests.

RESULTS: The DHP-3D included three dimensions defined as mood, eating and social limitations, and the DHP-5D added dimensions defined as hypoglycaemic attacks and vitality. For both, the random effects generalized least squares regression model produced consistent value sets, with the DHP-3D and DHP-5D ranging from 0.983 (best state) to 0.717 (worst state), and 0.979 to 0.618 respectively. The addition of the two extra dimensions leads to significant differences for the more severe levels of each matched dimension.

CONCLUSIONS: We have developed two diabetes-specific preference-based measures that, subject to psychometric assessment, can be used to provide condition-specific utility values to complement generic utilities from more widely validated measures such as the EuroQol-5 Dimension.

Diabetic Medicine. 2017, 1464-5491

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For further information on the Diabetes Health Profile

Further expert advice on the use, scoring and analysis of the DHP is available from the developer on request.
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