

## RUNNING HEAD: PATIENT QUALITY OF LIFE IN DEMENTIA

### Predictors of Quality of Life Ratings from Persons with Dementia: The Role of Insight

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Date of Submission: October 2009

Word Count: 3495

Research Sponsor: Bristol Research into Alzheimer's and Care of the  
Elderly (BRACE)

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The role of insight

Abstract

**Objective** Evidence suggests that people with dementia are able to respond accurately and consistently to questions about quality of life (QoL), although large discrepancies exist between patient and proxy ratings. This may be due, in part, to the reduced insight of the person with dementia. The aim of this study was to explore the predictors of QoL ratings in a sample of people with mild dementia, with a particular focus on the role of insight.

**Methods** Sixty-nine participants and their caregivers were recruited from a memory clinic setting. The Bath Assessment of Subjective Quality of Life in Dementia (BASQID), Alzheimer's Disease-Related Quality of Life Scale, Memory Functioning Scale, Alzheimer's Disease Cooperative Study Activities of Daily Living (ADL) Inventory and Mini Mental Status Examination were administered.

**Results** Regression analyses indicated that the strongest predictor of QoL ratings from persons with dementia was their awareness of memory function, such that lower awareness was associated with higher QoL ratings. Proxy ratings of activity performance and enjoyment of activity were also significant predictors of BASQID scores.

**Conclusions** Awareness of memory function impacts directly on patient QoL ratings and can also mask the effects of changes in other outcomes such as ADL function. Measures of awareness should therefore be employed alongside patient QoL ratings in order to ensure they are interpreted accurately. Discrepancies between patient and proxy QoL ratings do not necessarily occur because of patient unreliability, but may instead reflect the application of distinct modes of QoL assessment that emphasise very different outcomes.

## KEYWORDS:

Dementia; Quality of Life; Insight; Awareness; BASQID; Self-Report

## Introduction

Dementia imposes a significant burden on patients and their families and remains a major issue for health and social services (Ferri *et al.*, 2005). Achieving a full understanding of the impact of dementia, and the effectiveness of various therapies and interventions, is a complex task requiring both objective assessments of memory and function as well as attention to the subjective experiences, values and perspectives of the patient (Kitwood, 1995; Whitehouse, 1999). Quality of life (QoL) measures become an important resource in this context, offering valuable information about the impact of dementia on a person's life.

It has been argued that first-person evaluations of life quality are central to the measurement of QoL (The WHOQOL Group, 1995). This has led to a growth in the number of dementia-specific QoL assessments which elicit ratings directly from the person with dementia (Brod *et al.*, 1999; Selai *et al.*, 2001; Logsdon *et al.*, 2002; Ready *et al.*, 2002; Smith *et al.*, 2007; Trigg *et al.*, 2007b). Yet the reliability of patient ratings remains a matter for debate. Cognitive impairment and the apparent lack of insight demonstrated by many individuals with dementia are often cited as arguments against an over-reliance on patient QoL reports (Rabins *et al.*, 1999). As a result, first-person evaluations tend to be employed only as a supplement to the third-person ratings provided by a caregiver or alternative proxy (see Ettema *et al.*, 2005 for review).

The first of these arguments can be challenged. In the context of mild to moderate dementia, a growing body of evidence suggests that general cognitive impairment does not stop patients providing consistent and reliable responses to questions about QoL (Brod *et al.*, 1999; Feinberg and Whitlach, 2001; Logsdon *et al.*, 2002; Trigg *et al.*, 2007a). There is,

however, very little empirical evidence relating to the impact of insight on the validity of QoL judgements.

Lack of insight refers to a range of phenomena whereby people with dementia lack awareness (Aalten *et al.*, 2005) in relation to specific cognitive deficits (anosognosia), social functioning, behaviour, or general life circumstances. It has been argued that if a dementia patient is not fully aware of the disease “how can we believe a patient’s assessment of the impact of the disease on QoL?” (Whitehouse, 1999, p108). These doubts seem to be further justified by significant discrepancies in the QoL ratings provided by patients and their proxies. The association between caregiver and patient ratings appears to be weak or moderate at best (Logsdon *et al.*, 2002; Novella *et al.*, 2001). A general pattern emerges in which the proxies judge the patient’s QoL to be lower than the patients themselves and the unreliability of patient data appears to be confirmed.

Such conclusions must nonetheless be drawn with caution. Insight has a complex and multidimensional impact in dementia (Howarth and Saper, 2003) and awareness varies greatly amongst individuals and across a range of domains, such as self-care, memory, health status and language abilities (Green *et al.*, 1993; Vasterling *et al.*, 1995). To assume a direct connection between lack of insight and the unreliability of patient QoL evaluations is therefore problematic. Indeed, Brod *et al.* (1999) have argued that awareness of feeling states is distinct from awareness of cognitive and functional performance. This suggests a patient’s ability to report on how they *feel* about their QoL may be preserved even in cases where awareness of dementia is very limited.

Recent research has focussed on ascertaining the key determinants of self-report patient QoL ratings. This is important, if the meaning and significance of such ratings is to be grasped. Selai *et al.* (2001) found significant associations between QoL and social activities, dementia severity and neuropsychiatric symptoms, whilst Logsdon *et al.* (2002) also noted the impact of depression (see also Hoe *et al.*, 2006; 2007) and pleasant activities. Ready *et al.* (2004) examined predictors of patient

scores on the Dementia Quality of Life scale (DQOL; Brod *et al.*, 1999) and found neuropsychiatric symptoms (including agitation, depression and anxiety) to be the only significant predictors of global QoL. Activities of daily living scores failed to significantly predict QoL in this study (see also Hoe *et al.*, 2007; Logsdon *et al.*, 2002), as did scores for the Mini Mental State Examination (MMSE). A comprehensive review of this literature is provided by Banerjee *et al.* (2009). Interestingly, Ready *et al.* (2004) and Vogel *et al.* (2006) found no significant association between insight and QoL ratings. In a recent study, Hurt *et al.* (2009), found insight not to be related to QoL in patients with mild dementia, however found insight alone to be the sole predictor of QoL within moderate dementia. There is clearly a need for further investigation of the impact of insight on QoL ratings from cognitively impaired populations (Ready *et al.*, 2004 Hurt *et al.*, 2009).

The current paper explores these issues through the analysis of baseline data drawn from an ongoing 3-year longitudinal study designed to examine subjective QoL changes in people with early-stage dementia. These initial analyses focus on the main predictors of patient QoL ratings, with a particular emphasis on the role of insight as well as observable indices of function, behaviour and affect. The overall aim is to better understand the factors that influence QoL evaluations in people with mild dementia and, in so doing, to facilitate their interpretation.

## Method

### *Participants*

The sample included 69 people diagnosed with dementia according to DSM criteria (DSM-IV-TR; American Psychiatric Association, 2000) and their caregivers. Patients were recruited from a memory clinic setting and all had mild-stage dementia (an MMSE score of 18 or more; Tombaugh *et al.*, 1992) at the time of recruitment. A purposive sampling strategy was employed to include patients with a range of demographic characteristics such as type of dementia, age and living arrangements. Table 1 (below)

provides a full demographic summary of the sample. Ethical approval was obtained from the National Health Service Research Ethics Committee.

INSERT TABLE 1 HERE

### *Materials*

#### *The Bath Assessment of Subjective Quality of Life in Dementia*

(BASQID; Trigg *et al.*, 2007b)

The BASQID is a 14-item measure eliciting subjective QoL information direct from people with mild to moderate dementia. It can be scored as a single scale or as two subscales which assess life satisfaction (LS) and feelings of positive life quality (FPQ). Responses are transformed to give scores ranging from 0-100, with higher scores indicative of a better QoL. The BASQID and its subscales demonstrate good reproducibility, internal consistency and construct validity (Trigg *et al.*, 2007b) and the measure exhibits moderate and low to moderate associations with the GDS-15 (15-item Geriatric Depression Scale) and the proxy completed WHOQOL-BREF respectively.

#### *Memory Functioning Scale*

(MARS-MFS; Clare *et al.*, 2002)

The MARS-MFS is a 13-item subscale of the Memory Awareness Rating Scale (MARS) which captures subjective views of memory functioning. It is administered to both the person with dementia and their caregiver and assesses the patient's capacity to 'manage' across a range of everyday memory situations. Scores range from 0-52 with higher scores indicating better memory function. Discrepancy scores (obtained by subtracting the caregiver's rating from the patient's) assess the patient's awareness of memory. A positive discrepancy value indicates that the patient has some lack of insight in relation to their memory function. The MARS-MFS has good internal consistency, reproducibility and criterion validity, the latter having been established in relation to both the Memory Insight and Memory Symptoms questionnaires (Clare *et al.*, 2002).

*Alzheimer's Disease Cooperative Study Activities of Daily Living Inventory (ADCS-ADL; Galasko et al., 1997)*

The ADCS-ADL contains 23 questions about basic and instrumental activities of daily living (ADL and IADL). The questions all require an informant to provide a current assessment of the patient's capacity to perform particular daily activities. Total scores for the scale range from 0-78, with higher scores indicating independent performance. Test-retest reliability of the ADCS-ADL is good and the measure has demonstrated sensitivity to disease progression (Galasko et al., 1997).

*Alzheimer's Disease-Related Quality of Life Scale (ADRQL; Rabins et al., 1999)*

The ADRQL is a measure of patient health-related QoL that is usually administered to a caregiver. The scale contains 47 true or false items divided into five subscales: Social Interaction, Awareness of Self, Feelings and Mood, Enjoyment of Activities, and Response to Surroundings. Each subscale can be scored separately or combined to give a total score for QoL. Scale scores are determined using a preference-based weighting approach, where weights for QoL indicators differ according to pre-determined ratings of importance. Scores for each subscale range from 0-100, with higher scores indicating a better QoL. The ADRQL demonstrates good internal consistency for the scale and subscales (Black et al., 2000) and has shown concurrent validity (Gonzalez-Salvador et al., 2000).

*Mini Mental State Examination (MMSE; Folstein et al., 1975)*

The MMSE is a widely used measure of cognitive function, with a maximum score of 30 points. It assesses aspects of orientation to time and place, registration, attention, calculation, recall, language, and visual construction. Higher scores indicate better cognitive function. MMSE scores can validly discriminate between people with dementia, depression, or cognitive impairment with depression (Folstein et al., 1975). The

measure has demonstrated good test-retest and inter-rater reliability and has been extensively validated (Tombaugh & McIntyre, 1992).

### *Procedure*

Written informed consent was obtained from both patient and caregiver and assessments were administered in the patient's home. The patient completed the BASQID, MMSE and MARS-MFS, whilst the ADRQL, ACDS-ADL and MARS-MFS were completed by the caregiver. Patients and caregivers were kept apart during scale completion to eliminate the possibility of mutual influence.

### *Analysis*

Descriptive statistics for all scales were calculated and bivariate associations between the main study variables were explored using Spearman correlation coefficients. Due to multiple univariate analyses we used  $p < 0.01$  level for significance. Stepwise hierarchical multiple regression was used to determine predictors of self-report QoL ratings. Given the exploratory nature of this analysis, all scale data was initially entered into the regression. In a second step, moderator analysis was used to explore possible interactions between significant predictors in the model. Internal consistency of BASQID scores was explored using Cronbach's alpha across high and low insight groups.

## Results

All respondents were able to complete the assessments. Missing data was only recorded for one question in the carer-completed ADRQL (Table 2). Mean score on the BASQID was 60.38 (SD = 14.49) with values for the 25% and 75% quartiles of 50 and 70 respectively. In all but four cases, discrepancy scores on the MARS-MFS were positive, indicating reduced insight in the person with dementia. The distribution of scores on the ADRQL total and subscales displayed a clear negative skew, with median values within the range 77-88 for all scales except Enjoyment of Activities.

INSERT TABLE 2 HERE



### *Stage 1 Analyses*

Spearman correlation coefficients (Table 3) indicated that the association between patient QoL scores, measured by the BASQID total score, and the caregiver ratings of patient QoL, captured by the ADRQL total score, was not significant ( $r = 0.23$ ,  $p > 0.01$ ). The strongest associations were found between BASQID scores and scores on the Social Interaction and Enjoyment of Activities subscales of the ADRQL ( $r = 0.33$ ,  $p < 0.01$ ;  $r = 0.32$ ,  $p < 0.01$ ) and MARS-MFS discrepancy scores ( $r = 0.31$ ,  $p < 0.01$ ), which are indicative of the patient's level of insight in relation to their own memory function. The MMSE measure of cognitive function failed to show any significant association with total scores on either the BASQID ( $r = 0.05$ ,  $p > 0.01$ ) or the ADRQL total ( $r = 0.20$ ,  $p > 0.01$ ). Interestingly, MARS-MFS discrepancy scores did not correlate significantly with any of the proxy ratings of QoL or with MMSE scores. However, they did show a moderate correlation with ADCS-ADL scores ( $r = -0.45$ ,  $p < 0.01$ ) and hence with activities of daily living performance. ADCS-ADL scores also demonstrated a significant correlation with the Enjoyment of Activities subscale of the ADRQL ( $r = 0.36$ ,  $p < 0.01$ ).

No demographic variables were related to BASQID scores, inasmuch as no significant difference was observed between the QoL ratings of men and women ( $t = 0.57$ ,  $p > 0.01$ ) and QoL ratings showed no significant association with age ( $r = -0.07$ ,  $p > 0.01$ ).

INSERT TABLE 3 HERE

### *Stage 2 Analyses*

Three stepwise hierarchical linear regressions were used to determine the independent predictors of patient QoL scores on the BASQID and its two subscales (LS and FPQ). In the first step, scores on the ADCS-ADL and MMSE, discrepancy scores from the MARS-MFS and the five subscales of the ADRQL were entered into the model. For the BASQID total score, LS and FPQ subscales, only ADRQL Enjoyment of Activities, ADCS-ADL and MARS-MFS discrepancy scores were significant predictors (Table 4). For

each of the three models, MARS-MFS discrepancy scores were the strongest predictor with ADCS-ADL scores the second strongest. This means that higher patient QoL ratings were best predicted by lower levels of patient insight in relation to their own memory function, better ADL performance and increased enjoyment of activities.

INSERT TABLE 4 HERE

As a second step, we entered two interaction terms (MARS-MFS x ADCS-ADL and MARS-MFS x ADRQL Enjoyment of Activities) to explore the possibility that insight might act as a moderator in the relationships between patients' QoL ratings and scores on the ADCS-ADL and ADRQL Enjoyment of Activities scales. Scores on the predictors were centred by transforming to Z scores prior to calculation of the interactions. Neither of these interaction terms proved to be a significant predictor, and the model did not change in step 2.

Internal consistency of the BASQID and its subscales was then calculated to eliminate the possibility that the observed association between patient QoL scores and insight might be due, in part, to differences in the reliability of the BASQID when it is used by patients with higher or lower levels of insight. This was not the case. A median split on the MARS-MFS discrepancy score was used to divide the sample into high (n=32) and low (n=37) insight groups and Cronbach's alpha was calculated. The values of alpha were 0.88 and 0.92 respectively for the BASQID total score; 0.85 and 0.87 for the LS subscale, and 0.82 and 0.87 for the FPQ subscale.

## Discussion

The current study found a weak association between patient ratings of QoL, made using the BASQID, and proxy ratings measured by the ADRQL subscales. This finding supports previous research which suggests a clear disparity between patient and proxy measures of life quality. Significant predictors of patient QoL ratings were awareness of memory function (as

indicated by MARS-MFS discrepancy scores), proxy ratings of ADL function and the Enjoyment of Activities subscale within the ADRQL. In other words, patients with less insight about their own memory function, with better ADL ability and who exhibited more frequent displays of enjoyment were likely to report higher levels of QoL. Of these, awareness of memory function was found to be the strongest predictor.

Whilst a relationship between patient QoL ratings and lack of insight has previously been proposed in the literature (Whitehouse, 1999), this study is the first to demonstrate the relationship empirically in people with mild dementia, using a rigorous measure of insight. We would argue that this contrasting finding serves only to confirm the multidimensional nature of insight in dementia and the related need to develop and apply rigorous domain-specific insight measures (Clare *et al.*, 2002; Clare, 2004). Previous research on insight and QoL (Ready *et al.*, 2004; Vogel *et al.*, 2006; Hurt *et al.*, 2009) has approached insight through dichotomous or categorical global ratings, using mostly clinician judgements of the patient's awareness. In contrast, the current study has employed the MARS-MSF which uses multiple ratings of specific behaviours provided by both patient and caregiver and focuses on a single aspect of insight, namely awareness of memory function.

It becomes very tempting to interpret the QoL ratings of patients with lowered awareness as a simple case of 'blissful ignorance'. If this were the whole story, however, lack of awareness of memory function should have emerged as the sole predictor of patient QoL ratings. It did not. ADL function and observable enjoyment of activities were also incorporated into those ratings and their respective associations with QoL were not moderated by memory awareness. This suggests a more complex situation in which some awareness of daily living activity and of enjoyment may remain intact even when awareness of memory function has effectively been lost.

Brod *et al.*'s (1999) suggestion that awareness of feeling states may be distinct from awareness of cognitive function seems very relevant in this

context. Whilst dementia patients may eventually lack direct awareness of their ADL function and performance, they may nonetheless retain awareness of the *feelings* these tasks elicit. The more functionally able they are, the more frequently they will engage in ADL, and the more opportunity they will have to experience positive feelings as a result. These feelings then form the basis of the patient's own QoL assessments. The significant correlation observed between ADL function and enjoyment of activities in the current study supports this proposal. Further support is provided by the regression analyses for the BASQID subscales which show that ADL function is most strongly associated with a subscale (the FPQ) designed specifically to assess positive feelings (such as happiness, enjoyment, and self-efficacy) in the person with dementia.

Our findings also demonstrate that changes in awareness of memory function may also mask the effects of changes in other outcomes such as ADL function. No significant correlation was found between ADL performance and patient QoL in this or several earlier studies (see also Logsdon *et al.*, 2002; Hoe *et al.*, 2007; Ready *et al.*, 2004). However, when ADL scores were entered into a regression analysis alongside a measure of memory awareness, ADL function emerged as the second strongest predictor of patient life quality. This suggests that as dementia progresses, any reduction in QoL brought about by worsening ADL function may well be offset by improvements in QoL arising from a concurrent lack of insight about that function and its outcomes.

These findings and observations have two major implications. Firstly, the potential masking effect suggests that some relevant measure of insight or awareness needs to be included in all batteries of assessment which target the well-being of dementia patients. This will be vital if the meaning of a change, or lack of change, in patient QoL measurements are to be correctly interpreted. It may indeed be particularly relevant to trials of pharmacological and therapeutic interventions, where improved patient function might otherwise be masked (and hence wrongly assumed to confer no QoL gain) if measurements are analysed in isolation or without consideration of the patient's level of insight.

Secondly, it is important that the strong association between awareness of memory problems and patient QoL ratings revealed by the current study is not simply taken as evidence that patient QoL ratings are unreliable or uninformed. Reliability coefficients for all the BASQID scales remained stable above 0.8 across both high and low insight groups and whilst lowered awareness in a dementia patient tends to yield higher QoL ratings than those inferred by observation or proxy ratings, there is no reason to assume this occurs because of patient ignorance. On the contrary, we have seen that ADL function and enjoyment of activities are systematically incorporated in their QoL ratings.

It seems more likely that the discrepancy between patient and proxy ratings occurs simply because two very distinct modes of QoL assessment, which emphasise very different outcomes, are being employed. Whilst observational or proxy ratings (and the measures through which they are gathered) commonly provide QoL judgements based upon an appraisal of the patient's functional performance and their ability to 'get the job done', the dementia patient may be appraising the situation on the basis of the mood states and feelings the activity engendered. The two assessments may not even be directly comparable, an assertion which is supported by the traditionally low association of patient and proxy QoL measures. Indeed, in the context of more severe dementia, our findings suggest that awareness of memory function, ratings of ADL function and overt indices of enjoyment may supersede proxy QoL ratings as a surrogate measure of patient-perceived life quality.

In conclusion, our data suggests that the decrements in awareness associated with dementia may ultimately lead a patient to a rejuvenated view of their life quality. It is important that such changes are acknowledged and recorded. Far from being ignorant (blissfully or otherwise), dementia patients may continue to base their QoL assessments on a rational appraisal of their current life circumstances which exploits all the information available to them. None of us could do more. These assessments may be feeling-centred but given an

appropriate measure of QoL they are still reliable. Judging the QoL of dementia patients solely on the basis of functional failure or in relation to proxy ratings is certainly convenient, but it may ultimately fail to capture or help us understand the experience of people with dementia. Understanding such experience will be vital if their life quality is to be maximised.

**Conflict of interest**

None

**Description of author's roles:**

Dr Trigg and Professor Jones were responsible for the initial conception and design of the study. Dr. Trigg and Dr. Watts were responsible for carrying out the data analysis, interpretation of results and preparation of the draft manuscript. Professor Jones and Ms. Tod reviewed the results and contributed to the final drafting of the manuscript. Ms. Tod was also responsible for the acquisition of all data. All authors have approved the final version of the manuscript.



## **Acknowledgements**

We would like to thank all persons with dementia and caregivers who participated in the study. Also thanks must go to the staff at the Research Institute for the Care of Older People, in Bath and in particular Ms Dulcie Cormack for her practical contribution to the study.

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**Table 1: Sample characteristics**

		Sample (n=69)
Probable diagnosis	Alzheimer's / Mixed	54 (78%)
	Vascular	7 (10%)
	Frontotemporal	5 (7%)
	Lewy Body	3 (5%)
Cognitive ability	MMSE mean (s.d.)	22.43 (2.44)
	MMSE median (range)	23 (18-27)
Sex	Male	39 (57%)
	Female	30 (43%)
Age	<65	3 (5%)
	65-74	10 (14%)
	75-85	49 (71%)
	>85	7 (10%)
Living arrangements	Living alone	14 (20%)
	Living with spouse/partner	49 (71%)
	Living with relative/other	6 (9%)
Primary caregiver	Spouse/partner	49 (71%)
	Child	18 (27%)
	Sibling	1 (1%)
	Other relative	1 (1%)

**Table 2: Descriptive statistics for BASQID, ADRQL, ADCS-ADL and MARS-MSF**

	n	Mean	SD	Median	Min	Max
<b>BASQID total</b>	69	60.38	14.49	57.14	21.43	96.43
BASQID LS	69	57.07	14.89	56.25	18.75	93.75
BASQID FPQ	69	64.79	16.86	62.50	16.67	100.00
<b>ADRQL total</b>	68	79.72	13.85	83.62	40.07	98.39
ADRQL Social Interaction	69	82.64	16.94	86.07	26.47	100.00
ADRQL Awareness of Self	69	75.24	15.72	77.21	34.23	100.00
ADRQL Feelings and Mood	68	81.00	17.79	88.36	32.56	100.00
ADRQL Enjoyment of Activities	69	66.17	26.72	61.11	.00	100.00
ADRQL Respond to Surroundings	69	87.60	14.11	87.63	45.82	100.00
<b>ADCS-ADL</b>	69	50.04	12.38	50.00	19.00	73.00
<b>MARS-MSF discrepancy scores</b>	69	20.16	11.27	21.00	-7.00	39.00

BASQID = Bath Assessment of Subjective Quality of Life in Dementia; LS = Life Satisfaction; FPQ = Feelings of Positive Quality of Life; ADRQL = Alzheimer's Disease-Related Quality of Life Scale; ADCS-ADL = Alzheimer's Disease Cooperative Study Activities of Daily Living Inventory; MARS-MSF = Memory Functioning Scale

**Table 3: Spearman Correlations between study variables**

	<b>BASQID Total</b>	BASQID LS	BASQID FPQ	<b>ADRQL Total</b>	ADRQL Social Interaction	ADRQL Awareness of Self	ADRQL Feelings and Mood	ADRQL Enjoyment of Activities	ADRQL Respond to Surroundings	<b>ADCS- ADL</b>	<b>MARS-MSF discrepancy score</b>
BASQID LS	.93**										
BASQID FPQ	.91**	.71**									
<b>ADRQL</b>	.23	.18	.24*								
ADRQL Social Interaction	.33**	.32*	.29*	.78**							
ADRQL Awareness of Self	-.04	-.04	-.07	.64**	.49**						
ADRQL Feelings and Mood	.17	.09	.23	.82**	.58**	.33**					
ADRQL Enjoyment of Activities	.32**	.26*	.34**	.66**	.48**	.26*	.47**				
ADRQL Respond to Surroundings	.11	.09	.13	.61**	.29*	.21	.47**	.33**			
<b>ADCS-ADL</b>	.25*	.15	.33**	.38**	.29*	.23	.16	.36**	.14		
<b>MARS-MSF discrepancy score</b>	.31**	.39**	.19*	-.19	-.03	-.10	-.12	-.18	-.12	-.45**	
<b>MMSE</b>	.05	.04	.08	.20	.05	.18	.02	.28*	.17	.32*	-.06

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\*\* p<0.01

\* p<0.05



**Table 4: Significant predictors of BASQID scale scores**

	BASQID		BASQID LS		BASQID FPQ	
	$\beta$ (SE $\beta$ )	$\beta$	$\beta$ (SE $\beta$ )	$\beta$	$\beta$ (SE $\beta$ )	$\beta$
ADRQL Enjoyment of Activities	0.16* (0.05)	0.29	0.13* (0.06)	0.25	0.18* (0.06)	0.29
ADCS-ADL	0.46** (0.13)	0.39	0.36** (0.14)	0.30	0.60** (0.16)	0.43
MARS-MSF discrepancy scores	0.80** (0.13)	0.62	0.81** (0.14)	0.62	0.77** (0.16)	0.51
Model %	43		37		38	
F =	16.01		12.48		13.26	
P $\leq$	0.001		0.001		0.001	
Adjusted R <sup>2</sup>	0.40		0.34		0.35	

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\*\*  $p < 0.01$

\*  $p < 0.05$