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## A new instrument to describe indicators of well-being in old-old patients with severe dementia – The Vienna List

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### Abstract

**Background:** In patients with very severe dementia self-rating of quality of life usually is not possible and appropriate instruments for proxy-ratings are not available. The aim of this project is to develop an instrument of clinical proxy-ratings for this population.

**Methods:** Using electronic instruments, physicians and nurses recorded patient behaviour and changes of behaviour over a period of one year. Based on these data a list of 65 items was generated and subsequently allocated to 14 categories. This list was tested in 217 patients (61–105 yrs) with dementia diagnosed according to ICD-10 by both physicians and nurses. The severity of dementia was assessed by means of the Global Deterioration Scale (GDS) and the Brief Cognitive Rating Scale (BCRS). The Spitzer-Index (proxy-rating) was used as a global quality of life measure. Activity of daily living was rated using the Barthel Index.

**Results:** A factor analysis of the original 65 items revealed 5 factors (communication, negative affect, bodily contact, aggression, and mobility). By stepwise removing items we obtained satisfactory internal consistencies of the factors both for nurses' and physicians' ratings. The factors were generally unrelated. The validity of the instrument was proven by correlations of the factors communication and mobility with the Brief Cognitive Rating Scale (BCRS) and the Barthel-Index.

**Conclusion:** The results demonstrate the reliability and validity of the Vienna List as a proxy rating measurement of quality of life in patients with severe dementia. The psychometric properties of the scale have to be proved in further studies.

### Background

In industrial societies the proportions of old people and of people suffering from dementia are steadily increasing.

Consequently, the number of people depending on different types of institutional care is growing. The care is provided in general hospitals, geriatric hospitals, nursing

homes, private homes, and senior residences and within the families. Obviously, there are large differences in costs and efficacy of these different types of care. In general, quality of life data have been increasingly appreciated as the key outcome measure for the assessment of therapeutic interventions and for the usefulness of various treatment facilities. Quality of life is defined by WHO as "an individual's perception of their position in life, in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns. It is a broad ranging concept, effected in a complex way by the person's physical health, psychological state, level of independence, social relationships and their relationships to salient features of their environment" [1]. As concerns people with dementia, many of the instruments in use represent brief global measures, which cannot be applied to patients with severe dementia.

The most important reason for this slow growth of empirical data in this area probably relates to the obvious methodological problems of obtaining reliable subjective accounts of individuals with severe dementia who have compromised cognitive abilities, frequently with concurrent impaired communicative skills.

Due to these impairments in this group of patients most of the available instruments are not applicable for assessing quality of life related issues by means of traditional measures such as questionnaires or interviews which require a highly complex procedure of introspection and evaluation, involving several components of cognition including implicit and explicit memory [2].

Facing these problems, attempts have been made to develop direct observational methods [3] measuring positive affects such as pleasure, interest, and contentment as well as negative affects such as sadness, anxiety/fear, and anger according to operationalized criteria during a series of 10-minutes direct observation. An alternative approach was chosen by the Bradford Research Group in the UK [4] with the Dementia Care Mapping (DCM) based on the psychosocial model of "person-centred care" which provides detailed observational ratings covering aspects of articulation, feeding, social withdrawal, passive engagement, walking and a number of indicators of well-being.

Literature searches (-2003) of Medline, Embase, Psyclit, Cinahl using the keywords dementia and well-being and quality of life were conducted. Lawton et al. [5] developed the Minimum Data Set (MDS) comprising cognition, activities of daily living, time use, depression, and problem behaviours. He proposed to include observations of demented patients' emotional behaviours [6]. Most of the measurements are derived from existing instruments and are confined to few of the following dimensions: affect,

activity, enjoyment, self-esteem, and social interactions [7]. Ready and Ott concluded from their review [7] that the psychometric properties of most of the available instruments have to be regarded as preliminary.

As mentioned above, there were no quality of life assessment tools for patients with very severe dementia as representative of our population. Unfortunately, the instruments developed for demented patients were not found applicable to our patients who were in much more advanced stages of dementia (e.g. the Mini Mental State Examination could not be completed by any of our patients). For this reason a project was launched in 1998 by the department of Palliative Geriatrics (Geriatriszentrum am Wienerwald), to develop a new instrument based on observations made by the staff (physicians, nurses and physiotherapists) completely independent on the patients' cooperation.

## Methods

### Patients

In the present study 217 consecutive patients (44 males, 173 females) were included. The average age was 84 years (range 61–105 years). The majority of patients suffered from severe dementia according to ICD-10 (34,5 % F00 – Dementia in Alzheimer's Disease; 61,5 % F01 – Vascular Dementia; 4,0 & F02 – other). It appeared that more women (38 %) had been diagnosed as suffering from Alzheimer's disease compared with men (23 % –  $\chi^2$  (df = 2) = 6,05; p = 0,049). As concerns age, the patients with Alzheimer's disease (87,3 ± 5,7 years) and vascular dementia (86,3 ± 7,0 years) were significantly older than those with other diagnoses (78,5 ± 15,6 years – t = 3,27; p = 0,002 and t = 2,74; p = 0,007 respectively).

### Development of the item-pool

Thirteen staff members comprising doctor, nurses, and therapists from the department of Palliative Geriatrics at the Geriatriszentrum am Wienerwald in Vienna had observed severely demented patients during a one year period (May 1998 to April 1999). The patient's behaviour was documented at one of the wards (32 beds). Based on this documentation, 65 items for the description of behaviour in demented inpatients were derived and allocated to categories, supposedly reflecting relevant aspects of their well-being such as voice, language, mood, eye contact, acceptance of body contact, gait, muscular tension, hand movement, sleep, activities, communication, independence concerning food intake. This approach is different from prevailing approaches, which mainly are based on the use of items from existing instruments measuring specific aspects.

Subsequently, by means of this item-list, 771 assessments of 217 in-patients in various situations such as eating,

dressings, grooming had been obtained between June 1999 and September 2000 by physicians and nurses. Each of the original 65 items was scored on a 5-point Likert scale from 0 = never to 4 = always.

**Further assessments**

Patients were diagnosed according to ICD-10. They were rated by means of the Brief Cognitive Rating Scale (BCRS) [8], the Global Deterioration Scale (GDS) [9], the Barthel-Index [10], and the Spitzer Index [11].

The BCRS describes the severity of cognitive impairment providing five main axes (concentration, short term memory, long term memory, orientation, and self-care ability) and five co-axes (language, psychomotoric, mood and behaviour, drawing skills, calculating skills) each rated on a 7-step scale. The GDS is a proxy rating scale to assess the severity of dementia in elderly people on a seven point Likert-type scale (1 = no impairment; 7 = most severe impairment).

The Barthel-Index was used to assess the activity of daily living in 10 areas (feeding, transfers bed to chair and back, grooming, toilet use, bathing, mobility, climbing stairs, dressing, stool control, bladder control).

The Spitzer Index is a global quality of life measure covering five areas (activity, daily life, health, social relations, future) with a maximum score of 10 points.

The BCRS, GDS, and Spitzer Index had been rated by physicians and the Barthel index by nurses. All ratings including the 65 items list were made on the same occasion. Data collection was carried out using electronic questionnaires implemented through the Quality-of-Life-Recorder technology [12].

**Statistical analysis**

Descriptive statistics were generated for demographic data and diagnostic categories and for the BCRS and GDS scales, for the Barthel and Spitzer Indices, as well as for the newly developed instrument.

A factor analysis (principle component analysis, oblimin with Kaiser normalisation as rotation method), based on these 771 assessments was performed. The number of interpretable factors was determined by interpretation of a Scree plot. The consistency of the factors was tested by Cronbach's alpha coefficients. To improve the consistency of the scales, items have been deleted based on the criteria of changes in magnitude of the Cronbach's alpha coefficients and on the fit of the item with the content of the core items of the factors. To test the stability of the factor structure, we conducted separate analyses for doctors and nurses. For testing construct validity, we used the two external criteria, Brief Cognitive Rating Scale and the Barthel-Index.

To test for inter-rater reliability Spearman rank correlation coefficients were calculated. We included only data in which the electronic recording confirmed that it was obtained at exactly the same time.

**Results**

Most patients suffered from severe dementia as indicated by the results of the BCRS (mean ± SD: 57 ± 8.8) and GDS (mean ± SD: 5.7 ± 1.1) and the low level of activity of daily living (mean ± SD of Barthel Index: 26.8 ± 29.7) in the present sample also reflected by the distribution of diagnoses according to ICD-10.

Of the 771 assessments 386 had been performed by nurses and 385 assessments by physicians. By means of the electronic recordings we identified 22 pairs of assessments made at the same time by a nurse and a physician. A planned feasibility analysis after 120 assessments resulted in the exclusion of the Spitzer Index because of a general floor effect (mean score <3).

The factor analysis suggested five factors based on the interpretation of the Scree plot. The results of the five-factor solution are given in Table 1 with high Eigenvalues and an explained variance of more than 60 per cent.

**Table 1: Eigenvalues and explained amounts of variance for the 5-factor solution**

Factor	Eigenvalues		% of Variance		Cumulative %	
	nurse	physician	nurse	physician	nurse	physician
1	10.0	10.7	24.4	26.0	24.4	26.0
2	5.7	6.1	13.8	15.0	38.2	41.0
3	4.9	4.8	11.9	11.8	50.0	52.1
4	2.5	2.1	6.1	5.0	56.1	58.0
5	2.0	2.5	4.9	6.1	61.0	63.9

Extraction Method: Principal Component Analysis.

**Table 2: Structure Matrix**

Factor	1		2		3		4		5	
	Nurse	Physician	Nurse	Physician	Nurse	Physician	Nurse	Physician	Nurse	Physician
<b>Communication</b>										
ITEM 59	0.82	0.83	-0.19	-0.14	0.04	-0.32	0.29	0.05	0.06	0.25
ITEM 62	0.81	0.64	0.02	0.16	0.08	-0.39	0.28	0.22	-0.09	0.34
ITEM 6	0.79	0.78	-0.26	0.13	-0.07	-0.29	0.18	0.08	0.10	0.17
ITEM 61	0.79	0.67	-0.23	-0.13	0.10	-0.56	0.22	0.09	0.08	0.25
ITEM 8	0.78	0.81	-0.20	0.08	-0.16	-0.25	0.14	0.12	0.12	0.18
ITEM 65	0.73	0.77	-0.27	-0.13	-0.05	-0.05	0.52	0.10	0.01	0.48
ITEM 56	0.70	0.69	-0.08	0.08	-0.15	0.07	0.07	-0.06	0.05	0.10
ITEM 14	0.70	0.85	-0.11	-0.11	0.02	-0.10	0.44	-0.06	0.15	0.26
ITEM 32	0.66	0.64	-0.14	-0.06	0.35	-0.48	0.03	-0.11	0.15	0.22
ITEM 31	0.65	0.65	-0.12	0.01	0.32	-0.54	0.08	0.00	0.15	0.19
ITEM 13	0.64	0.76	-0.24	-0.04	0.06	-0.42	0.11	0.13	0.12	0.20
ITEM 50	0.64	0.77	-0.40	-0.19	-0.04	-0.17	0.46	-0.03	0.19	0.35
ITEM 64	0.62	0.61	0.05	0.13	0.06	-0.17	0.49	-0.21	0.03	0.40
ITEM 60	0.59	0.69	0.12	0.17	-0.27	0.03	0.01	0.28	-0.11	0.07
ITEM 15	0.45	0.73	0.03	-0.13	-0.08	0.19	0.34	-0.19	0.12	0.06
<b>Negative Affect</b>										
ITEM 18	-0.08	0.04	0.83	0.87	-0.03	-0.14	-0.08	0.11	-0.28	-0.02
ITEM 22	-0.04	0.09	0.80	0.74	0.11	-0.34	-0.10	0.08	-0.20	0.00
ITEM 3	-0.07	0.02	0.75	0.82	0.16	-0.18	-0.13	0.17	-0.11	-0.06
ITEM 24	-0.09	-0.01	0.74	0.76	-0.05	-0.18	-0.05	0.12	-0.37	0.08
ITEM 27	0.04	0.02	0.66	0.77	-0.13	-0.10	-0.17	0.45	-0.45	-0.05
ITEM 17	-0.28	-0.17	0.66	0.71	-0.08	0.14	-0.16	0.38	-0.58	-0.12
ITEM 25	-0.30	0.17	0.65	0.63	0.03	-0.02	-0.29	-0.02	-0.08	-0.07
ITEM 54	-0.20	-0.20	0.62	0.58	-0.09	0.10	0.19	0.28	-0.34	0.05
ITEM 53	-0.10	-0.01	0.60	0.50	-0.07	0.23	0.14	0.17	-0.28	0.01
ITEM 47	-0.28	-0.26	0.53	0.61	0.00	0.11	-0.26	0.37	-0.45	-0.11
<b>Bodily contact</b>										
ITEM 35	0.00	0.17	0.02	-0.03	0.93	-0.76	-0.08	-0.13	0.11	-0.11
ITEM 34	0.01	0.27	0.00	0.07	0.93	-0.81	-0.09	-0.12	0.12	-0.09
ITEM 33	0.03	0.37	0.00	0.14	0.90	-0.77	-0.09	-0.06	0.12	0.00
ITEM 36	-0.06	-0.21	0.01	0.10	0.89	-0.81	-0.13	-0.15	0.16	-0.08
ITEM 37	-0.06	-0.27	0.01	0.15	0.86	-0.76	-0.12	-0.16	0.17	-0.06
<b>Aggression</b>										
ITEM 4	-0.14	0.01	0.25	0.27	-0.19	0.08	0.13	0.91	-0.88	0.08
ITEM 19	-0.24	-0.05	0.31	0.18	-0.22	0.16	0.13	0.84	-0.83	0.09
ITEM 1	0.05	0.20	0.28	0.20	-0.07	0.12	0.01	0.71	-0.78	0.08
ITEM 29	0.22	0.11	0.20	0.21	-0.10	0.05	0.03	0.84	-0.77	0.15
<b>Mobility</b>										
ITEM 40	0.42	0.56	-0.31	-0.23	-0.20	0.08	0.79	-0.14	0.22	0.80
ITEM 41	0.49	0.64	-0.28	-0.27	-0.23	0.07	0.71	-0.19	0.23	0.63
ITEM 57	0.01	0.01	0.01	0.08	-0.05	0.00	0.68	0.14	-0.18	0.70
ITEM 42	0.04	0.07	0.07	0.06	-0.02	0.05	0.68	0.20	-0.18	0.80
ITEM 43	0.43	0.63	-0.43	-0.15	-0.08	-0.09	0.66	0.00	0.22	0.64
ITEM 55	0.41	0.46	-0.14	-0.07	-0.10	0.04	0.42	-0.23	0.03	0.34

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

To improve the consistency of the five factors, 18 of the original 65 items were deleted based on the criteria of changes in magnitude of the Cronbach alpha coefficients and on the fit of the item with the content of the core items of the factors. As a next step, eight further items were excluded due to different factor-loadings between raters and of content considerations resulting in the following five factors: communication (15 items), negative affect (10 items), bodily contact (5 items), aggression (4 items) and mobility (6 items). The factor structure matrix including the single items for physicians and nurses is shown in table 2 and demonstrates a high congruency of the factor structure between both groups of raters on the item level.

In addition, it appeared that the factors were generally unrelated to each other except for significant correlations between the factors 'communication' and 'bodily contact' ( $r = 0.25$ ;  $p < 0.001$  each) and of 'mobility' with 'negative affect' (physicians:  $r = 0.22$ ;  $p = 0.001$ ; nurses:  $r = -0.33$ ;  $p < 0.01$ ). The Cronbach alpha coefficients as a measure of internal consistency were high for both nurses and physicians (table 3). The congruence of nurses' and physician's ratings is further demonstrated by similar item severity (relative ratings) and selectivity of the single factors (table 4).

**Table 3: Cronbach alpha coefficients**

Factor	Number of Items	Nurse	Physician
1 – Communication	15	0.93	0.94
2 – Negative Affect	10	0.88	0.89
3 – Bodily Contact	5	0.90	0.90
4 – Aggression	4	0.86	0.87
5 – Mobility	6	0.81	0.82

**Table 4: Item severity and Item selectivity**

	Item severity		Item selectivity	
	Nurse	Physician	Nurse	Physician
Communication				
59 Responding to distant calls	0.57	0.63	0.82	0.85
62 Looking for contact	0.53	0.56	0.81	0.71
06 Speaks comprehensibly	0.64	0.69	0.79	0.81
61 Contact possible	0.83	0.90	0.79	0.74
08 Speaks meaningful groups of words	0.59	0.68	0.77	0.82
65 Eats and drinks by him-/herself	0.66	0.68	0.79	0.78
56 Reads newspaper	0.24	0.19	0.69	0.64
14 Carries out simple orders	0.39	0.64	0.73	0.84
32 Maintains visual contact	0.72	0.74	0.65	0.71
31 Visual contact possible	0.80	0.85	0.63	0.72
13 Comprehends single words	0.89	0.88	0.63	0.81
50 Uses both hands intentionally	0.62	0.67	0.70	0.79
64 Worries about others	0.25	0.23	0.65	0.63
60 Rings the bell	0.29	0.31	0.58	0.67
15 Carries out complicated orders	0.08	0.24	0.47	0.64
Negative Affect				
18 Full of despair	0.40	0.43	0.82	0.86
22 Sad/crying	0.32	0.36	0.77	0.75
03 Whining voice	0.33	0.32	0.72	0.83

**Table 4: Item severity and Item selectivity (Continued)**

24 Nervous/anxious	0.37	0.40	0.76	0.75
27 Wailing	0.30	0.31	0.69	0.80
17 Tensed	0.36	0.43	0.73	0.72
25 Resigned	0.27	0.38	0.65	0.63
54 Restless/confused	0.25	0.31	0.62	0.59
53 Problems to fall asleep	0.25	0.36	0.59	0.49
47 Muscular tension	0.37	0.43	0.60	0.62
<b>Bodily Contact</b>				
35 Bodily contact possible at shoulders	0.77	0.87	0.92	0.78
34 Bodily contact possible at arms	0.81	0.91	0.90	0.80
33 Bodily contact possible at hands	0.82	0.94	0.88	0.73
36 Bodily contact possible at the head	0.63	0.63	0.91	0.88
37 Bodily contact possible in the face	0.56	0.55	0.88	0.84
<b>Aggression</b>				
04 Aggressive voice	0.27	0.27	0.89	0.90
19 Aggressive acts	0.21	0.19	0.85	0.84
01 Loud voice	0.32	0.33	0.80	0.80
29 Insulting others	0.23	0.22	0.81	0.88
<b>Mobility</b>				
40 Walking upright	0.37	0.40	0.92	0.95
41 Walking straightup to	0.33	0.36	0.87	0.87
57 Departs from ward	0.07	0.05	0.53	0.46
42 Wanders around	0.16	0.17	0.53	0.62
43 Sitting upright	0.57	0.57	0.80	0.81
55 Ready to help on ward	0.13	0.09	0.55	0.54

For testing construct validity, we used two external criteria, the Brief Cognitive Rating Scale (BCRS) used by physicians and the Barthel-Index used by nurses (table 5). The correlation coefficients between the various areas of the BCRS and the two relevant scales of the new instrument (communication and mobility) point to a satisfactory validity. Concerning the second criteria, the Barthel-Index (a measure of activities of daily living), it was significantly correlated with the scales "communication" and "mobility" of our instrument. Furthermore, the latter was correlated with the scale "negative affect" and "acceptance of body contact" in the expected direction.

When testing for gender differences concerning the factors, we found significant differences for all but one factor (table 6).

The interrater-reliability between sub-samples of physicians and nurses proved to be satisfactory (table 7).

## Discussion

The special problem in the assessment of well-being in patients with severe dementia is their lack of competence which is compromising the reliability of their reports. Consequently, observer ratings are the only alternative for such self-ratings. However, observer ratings inherit the potential risk of overrating the well-being of patients if the provider and rater of health care services are identical. We have controlled for this risk by semi-quantitatively describing the frequency of distinct behaviour patterns in demented patients.

The results of this study demonstrate that the behaviour of old-old patients with severe dementia can be described by five factors of the Vienna List. By explaining more than

**Table 5: Correlations with BCRS scores and Barthel Index**

	Communication	Negative Affect	Bodily contact	Aggression	Mobility
<b>Physicians</b>					
BCRS 1 – concentration	-0.71*	0.05	0.07	-0.02	-0.45*
BCRS 2 – short time memory	-0.67*	0.02	0.11	-0.01	-0.42*
BCRS 3 – long time memory	-0.68*	0.14	0.09	0.08	-0.46*
BCRS 4 – orientation	-0.65*	0.12	0.12	0.11	-0.40*
BCRS 5 – everyday life competency	-0.47*	-0.04	-0.04	-0.10	-0.44*
BCRS 6 – language	-0.71*	-0.02	0.02	-0.09	-0.37*
BCRS 7 – psychomotorics	-0.41*	-0.01	0.06	-0.10	-0.59*
BCRS 8 – mood and behaviour	-0.60*	0.10	-0.02	0.03	-0.34*
BCRS 9 – constructive skills	-0.55*	0.03	0.02	-0.06	-0.34*
BCRS 10 – calculation skills	-0.59*	0.17*	0.09	0.09	-0.35*
Main axis	-0.73*	0.07	0.09	0.02	-0.49*
Co-axis	-0.71*	0.07	0.04	-0.03	-0.49*
BCRS total score	-0.74*	0.07	0.06	-0.01	-0.50*
<b>Nurses</b>					
Barthel Item 1 – feeding	0.70*	-0.21*	-0.10	0.02	0.63*
Barthel Item 2 – transfer	0.46*	-0.27*	-0.17*	-0.08	0.83*
Barthel Item 3 – personal care	0.41*	-0.17*	-0.02	-0.12	0.36*
Barthel Item 4 – toilet use	0.47*	-0.25*	-0.20*	-0.12	0.67*
Barthel Item 5 – bathing	0.08	-0.07	0.04	-0.06	0.09
Barthel Item 6 – moving	0.43*	-0.28*	-0.18*	-0.09	0.83*
Barthel Item 7 – stairs	0.32*	-0.23*	-0.14	-0.03	0.72*
Barthel Item 8 – dressing	0.51*	-0.23*	-0.22*	-0.09	0.67*
Barthel Item 9 – bowel	0.48*	-0.20*	-0.16*	-0.15*	0.57*
Barthel Item 10 – bladder control	0.44*	-0.20*	-0.22*	0.14	0.56*
Barthel Index	0.56*	-0.28*	-0.20*	-0.10	0.83*

\* p &lt; 0.001

60% of the total variance these five factors obviously cover a considerable part of the possible spectrum of behaviour in these patients.

Since nurses and physicians have different intensity of contact and corresponding different perspectives, it was

surprising that their assessments were highly correlated in three of the five factors. The two factors, aggression and mobility, yielded higher scores among the nurses as compared to doctors.

**Table 6: Factor Scores of Observations by Gender of the Patients**

Factor	Observations of Males (x ± SD) N = 123	Observations of Females (x ± SD) N = 648	t-score	p value
1 – Communication	34.8 ± 13.2	33.8 ± 11.8	0.82	0.415
2 – Negative Affect	9.5 ± 6.7	14.8 ± 6.7	-8.37	<0.001
3 – Bodily Contact	14.9 ± 4.3	16.7 ± 4.9	-4.18	<0.001
4 – Aggression	3.1 ± 3.0	4.3 ± 3.5	-3.21	0.001
5 – Mobility	8.1 ± 5.5	6.3 ± 5.5	3.38	0.001

**Table 7: Paired sample test and Spearman Rank correlation coefficients between nurses and physicians related to the same patient at the same day (22 pairs)**

Factor	Nurse (x ± SD)	Physician (x ± SD)	t-score/p	R/p
1 – Communication	25.8 ± 10.5	26.4 ± 8.9	-0.35/0.727	0.71/<0.001
2 – Negative Affect	11.9 ± 7.6	8.6 ± 5.0	2.46/0.023	0.57/0.006
3 – Bodily contact	15.9 ± 5.7	18.4 ± 2.9	-2.22/0.038	0.53/0.011
4 – Aggression	4.3 ± 3.0	2.2 ± 2.1	3.69/0.001	0.35/0.112
5 – Mobility	6.5 ± 5.7	5.1 ± 5.8	2.03/0.056	0.81/<0.001

As concerns aggression, there are mainly two explanations for this difference. Firstly, nurses spend more time and have closer contact with the patients and consequently have a higher risk to induce aggressive behaviour in the patients. In addition, the extended period of contact increases the chance to experience an episode of aggressive behaviour. Secondly, patients normally behave differently towards nurses and doctors due to differences in role expectation and familiarity related to the frequency of contact. However, we consider this later explanation as unlikely in these patients due to their cognitive impairment.

Regarding mobility it is plausible that the doctors report lower scores for mobility of the patients as the doctor mainly sees the patient under certain circumstances, i.e. during the rounds where the ward routines limit the mobility of the patient.

Since these five factors encompass most of the behavioural repertoire of demented old-old patients we assume that these factors can be regarded as a useful approach to describe the well-being in these patients.

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