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Differences in WHOQOL-100 domain scores in Parkinson's disease and osteoarthritis

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Summary

Background: The aim was to compare health-related quality of life (QOL) in patients with Parkinson's disease, osteoarthritis, and persons of a matched control group.

Material/Methods: The study was done in 178 patients (94 men and 84 women, 54 with Parkinson's disease and 58 with osteoarthritis) and 66 age- and sex-matched controls. The patients were randomly selected from a register of community health maintenance organizations. The main outcome measures were WHOQOL-100 domains and overall QOL.

Results: The mean scores of most of the WHOQOL-100 domains were significantly poorer for the Parkinson's disease patients. As expected, the scores for "mobility", "activities in daily living", and "working capacity" of the level-of-independence domain were significantly poorer in this group than in the osteoarthritis and control groups. These results indicate that the generic WHOQOL questionnaire discriminated between PD and OA patients, was sensitive to some aspects of patients' QOL perception and multidimensional problems, and was able to differentiate between PD and OA patients in the level-of-independence domain and in the facets we might expect to be mostly affected by the diseases. The frequencies of the separate clinical forms of Parkinson's disease were: rigidity-tremor in 76.8% of patients, rigidity in 13.7%, and tremor in 9.5%.

Conclusions: The patient groups showed the most changes in WHOQOL-100 domains with respect to all facets of the level-of-independence domain, „energy and fatigue" of the physical domain, and three facets of the environment domain. Impairment of QOL included more aspects of QOL in Parkinson's disease than in osteoarthritis patients.

key words: Parkinson's disease • osteoarthritis • quality of life • WHOQOL-100

Abbreviations: **PD** – Parkinson's disease; **OA** – osteoarthritis; **QOL** – quality of life

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BACKGROUND

The measurement of quality of life (QOL) in medicine is based on two main principles: subjective evaluation and multidimensional evaluation. Consideration of the patient's QOL assists in treatment comparisons and will prove increasingly important in the identification of services, facilities, and resource allocation for different patient groups. In cases of nursing care for older people with functional limitations, they should be assessed for their level of QOL. Research into factors that influence older peoples' lives and their QOL is important because cures may not be available, but relief from suffering may be possible by improving their QOL. This supports the increased consciousness of the influence of health and healthcare on QOL, which can be divided into global, health-related, and disease-specific [1]. Due to the co-morbidity usually present in older people, the impact of the specific disease on the overall QOL is difficult to assess [2–4].

In the case of patients with chronic illnesses and impaired mobility, QOL considerations are of special importance due to their consequences for the quality of everyday life. QOL studies in patients with mobility disorders have particular relevance. Impairment of mobility may vary from non-impairment to immobility, which leads to decreased physical function and social isolation and which together have widespread consequences in all aspects of the patient's life and decreased QOL. A review of literature on pain and QOL among people aged 75 years and over with arthritis was performed by Jakobsson et al. [1]. Pain, functional limitation, and increased age were found to decrease QOL among those with arthritis and social support was found to have positive effects [5–7]. In patients with OA, factors such as pain and impaired mobility may be the cause of decreased QOL [1]. Wirnsberger et al. [8] found that in arthritis the physical health domain was especially decreased and pain and mobility problems caused lower QOL. Briggs et al. [9] found that patients with OA had significantly lower values in all subscales of SF-36 compared with those of healthy people. There are more studies showing that patients with arthritis have lower QOL. In spite of this we still lack data about the areas of importance for QOL among older people with arthritis [1].

Several studies have looked into the relationship between PD and QOL and investigated whether QOL depends more on psychological or other domains [10–13]. In PD, damage to the brain and nerves changes the neurological status of the body. Loss of adaptation of complex movements in PD patients is related to cognitive processing and can strongly influence several aspects of QOL. Different instruments/scales were used in these studies [10,14,15], including the well-validated Parkinson's disease questionnaire PDQ-39 and the patient-specific quality-of-life measure PDQL developed in the Netherlands.

Different QOL measures (questionnaires) were used in PD and OA studies. This makes it hard to compare the variables assessed. More exact comparisons can be made regarding differences in QOL in PD and OA patients using the same QOL measure. The WHOQOL-100 generic measure is widely used to compare the QOL of different populations. Growing evidence that the questionnaire is sensitive and responsive to important changes in the physical and emotional domains of QOL [16–18] have led to its application across a spectrum of medical illnesses and conditions. WHOQOL-100 covers the respondent's perception and subjective evaluation of overall QOL and general health as well as different domains, i.e. physical health, psychological state, social relationships, environment, and spirituality/religion/personal beliefs. The questionnaire was shown to be a valid and reliable QOL instrument for different populations of healthy and ill persons [18]. The WHOQOL-100 provides the patient with the opportunity to rate different symptoms and evaluate the impact their health state has on their social life, their abilities to communicate, and so on. The WHOQOL-100 seeks subjective judgements by asking individuals to rate the occurrence of, frequency or intensity of, concern or worry about, and satisfaction with each of the 24 facets.

In this study we addressed the following questions: how do older patients with PD or OA assess their QOL compared with persons of comparable age with no mobility disorders; which particular life areas are most affected by these diseases; and what subjective importance are they given by PD and OA patients?

MATERIAL AND METHODS

The study design was comparative cross-sectional. It included 178 patients (94 male and 84 females): 54 patients with PD aged 69.5±6.8 years (29 male, 25 female), 58 patients with OA aged 68.0±5.7 years (31 male, 27 female), and 66 age- and sex-matched controls (34 male, 32 female) aged 68.5±6.7 years. The controls did not have joint or back disease or movement disorders and considered themselves subjectively as healthy.

The respondents were randomly selected from a register of community health maintenance organizations. PD patients were identified as having clinically diagnosed Parkinson's disease. During selection, the diagnosis of PD was established according to the following clinical criteria: 1) tremor; 2) bradikinesis, 3) hypokinesis or akinesis, 4) rigidity, and 5) asymmetrical beginning of the disease, the main criteria being bradikinesis, hypokinesis, or akinesis. The PD patients were classified in stages according to the Hoehn and Yahr scale and their motor disability was assessed by means of the Unified Parkinson's Disease Rating Scale (UPDRS). All patients in the OA group had clinical and radiographic evidence of osteoarthrosis. Patients who had just had joint replacement were excluded because these patients are focused on the outcome of the intervention and not on the usual condition.

There were patients with differing severity of current mobility limitation, ranging from mild to more severe limitations. The Mini Mental State Examination (MMSE) was applied to define disorders of the respondents' cognitive function. MMSE scores were 29–30. Patients with known dementia were excluded from the study.

No significant differences in terms of age and sex were found between the patient groups. All subjects were living at home. The WHOQOL-100, Mini Mental State Examination, and self-rated health status were used. Completion rates

for all the questionnaires were over 95%. The questionnaire was administered in face-to-face interviews at home. All patients had given their informed consent to participate in the study.

Statistics

The data are expressed as the mean and standard deviation. Internal validity was assessed by use of the Cronbach coefficient α for all respondents taken together. A coefficient of 0.70 was the minimal standard for reliability. Discriminant validity. Because of the non-normal distribution of most of the data, the Kruskal-Wallis test was used when comparing the facets and domain scores between groups. P values ⩽0.05 were considered statistically significant. All analyses were performed using the Statistical Package for Social Science (SPSS) for Windows

RESULTS

The psychometric properties of the WHOQOL-100 were investigated in the sample of 178 respondents. On the basis of these data, all facets of the WHOQOL-100 demonstrated good internal consistency, with Cronbach's α ranging from 0.65 (for "physical safety and security") to 0.95 (for "mobility and dependence on medication or treatments"). There were three facets which did not show satisfactory internal consistency coefficients: "personal relationships" (0.69), "physical safety and security" (0.65), and "physical environment" (0.67). The internal reliability assessed using Cronbach's α statistic had values for the WHOQOL-100 greater than 0.7. WHOQOL-100 demonstrated very good internal consistency. Cronbach's a exceeded 0.70 for all scales except for the facet "personal relationships".

The frequencies of the separate clinical forms of Parkinson's disease were: rigidity-tremor in 76.8% of patients (men: 84.0%, women: 73.4%), rigidity in 13.7% (men: 12.3%, women: 12.7%), and tremor in 9.5% (men: 3.7%, women: 13.9%).

In the PD patients' group, 31.0% of the men and 52.0% of the women rated their ability to move as "very much impaired" or "extremely impaired". In the OA group, 31.0% of the men and 52.0% of the women rated their ability to move as "very much impaired" or "extremely impaired". In the control group only 5.8% of the men rated their ability to move as "moderately impaired".

Mean scores of most of the WHOQOL-100 facets were significantly poorer for the PD patients. As expected, the scores for "mobility", "activities in daily living", and "working capacity" of the level-of-independence domain were statistically significantly poorer in this group than in the OA and control groups. However, overall QOL did not differ significantly from that of the OA patients and the control group (Table 1). There were significant differences concerning the level-of-independence domain. In PD patients it was this domain that deteriorated most.

PD patients tended to score lower on all facets of the WHOQOL-100 except for "social support" of the social-relationships domain and "positive feeling" of the psychological health domain. Between-group differences in the average

scores were statistically significant for the level-of-independence and environment domains (PD vs. OA) (Table 2).

Among the PD patients, the men tended to score higher on all domains and among the OA patients the women reported higher levels of independence (Table 3).

In the level-of-independence domain, the PD patients had significantly poorer quality of life than the OA patients. The sub-scales of physical and psychological health were found to be not significantly different between the two groups.

The women of the control group gave higher total scores for the set of questions assessing overall QOL and general health (13.28±2.89 vs. 11.48±2.96 in PD and 12.88±2.52 in OA patients), the physical domain (14.64±2.08 vs. 11.71±3.26 in PD and 13.19±2.74 in OA patients), the psychological domain (14.10±2.22 vs. 12.08±2.48 in PD and 13.11±2.00 in OA patients), and for the level-of-independence domain (17.08±1.56 vs. 9.90±2.79 in PD and 14.61±3.08 in OA patients).

There were nine facets for which significant differences between the PD and OA patients and the control group were detected.

Relying on the QOL differences obtained between the two groups of patients with impaired mobility we can conclude that the PD patients did not differ statistically significantly from OA patients with respect to their overall QOL, but differed with respect to the level-of-independence (P<0.0001) and environment domains (P<0.022), energy and fatigue of the physical domain (P<0.001), and negative feelings of the psychological domain (P<0.002). Analysis of the particular facets demonstrated that compared with the control group, both patient groups with impaired mobility reported changes. The PD group differed statistically significantly in all domains and overall quality of life and health scores (P<0.018). Moreover, the PD patients appeared to have a lower QOL with respect to "energy and fatigue" (P<0.001), "mobility" (P<0.0001), "activities of daily living" (P<0.0001), "working capacity" (P<0.0001), "opportunities for acquiring new information and skills" (P<0.043), "participation in and opportunities for recreation/leisure activities" (P<0.0001), and "transportation" (P<0.0001).

OA patients differed from controls more in physical capacity (P<0.001), the psychological domain (P<0.009), level-of-independence (P<0.0001), and spiritual domain (P<0.012). There were no significant differences between the OA patients and the control group with regard to the social-relationship and environment domains and overall quality of life and health scores.

What is the relationship between the various domains of QOL and the overall quality of life and health? By means of correlation analysis we studied the association between the facets and domains of WHOQOL and overall quality of life separately for the three respondents' groups. All six domains showed correlation with overall QOL among all three groups (P<0.05)

DISCUSSION

This study was aimed at exploring the QOL of patients with mobility disorders using the multidimensional generic

Table 1. Results of Mann-Whitney tests between WHOQOL domains according to patient groups.

	Value, by WHOQOL domain						
	Overall health and quality of life	Dom. I Physical Capacity	Dom. II Psychological health	Dom. IIILevel of independence	Dom. IV Social relationships	Dom. V Environment	Dom. VI Spiritual domain
PD vs. OA				P<0.0001		P=0.022	
OA vs. CG		P<0.001	P=0.009	P<0.0001			P=0.012
PD vs. CG	P=0.018	P<0.0001	P=0.004	P<0.0001	P=0.012	P=0.003	P=0.006

Table 2. Mean values for the WHOQOL-100 and its domains.

Domains	Parkinson disease		Osteoarthritis		Control group	
	Male	Female	Male	Female	Male	Female
I. Physical capacity	12.6552±3.1516	11.7067±3.2622	13.3011±2.6954	13.1934±2.7386	15.0784±2.1354	14.6354±2.0849
II. Psychological health	13.6276±2.5353	12.0800±2.4833	13.4849±2.3195	13.1136±2.0028	14.3235±1.4313	14.1021±2.2235
III. Level of independence	11.3448±2.9523	9.9000±2.7876	13.7823±3.2645	14.6111±3.0802	16.5760±2.5419	17.0781±1.5609
IV. Social relationships	13.7126±2.0504	12.0000±2.0023	13.4642±2.1543	13.8120±1.9857	14.1928±2.1656	13.7903±2.4598
V. Environment	12.7112±1.7978	11.3400±1.6819	12.9624±1.9503	12.8377±1.6578	13.6234±2.2787	12.6406±2.7210
VI. Spiritual	13.1724±3.0946	11.5600±3.1236	12.7527±3.0012	13.2436±2.3372	13.7941±2.1851	15.0000±2.4495
Overall quality of life and health	12.9655±2.3977	11.4800±2.9597	12.7742±2.6797	12.8765±2.5253	13.7059±2.3553	13.2812±2.8875

WHOQOL-100 questionnaire. Such an approach not only informs us of the function of patients with impaired mobility across the domains of WHOQOL-100 and indicates those most negatively affected by PD and OA, but it also facilitates comparison of the QOL of PD patients with the impact of OA on QOL. Our results indicated WHOQOL-100's good reliability. The Cronbach alpha internal consistency coefficients for the domains were between 0.73 for the psychological health domain and 0.94 for the environment domain, all being within the acceptable range. As for the facets, the alpha coefficients ranged from 0.65 for "physical safety and security" to 0.95 for "mobility", with 22 facets above 0.70.

Summarizing our findings we can state that the scores for overall QOL and health did not differ significantly among the three groups investigated. Nevertheless, the weighted scores obtained allowed us to identify life domains of importance to PD and OD patients and those most negatively affected. In both the PD and OA groups, QOL was impaired with respect to the domains of physical health (P<0.001), psychological health (P<0.004), the level of independence (P<0.0001), and the spirituality/religion/personal beliefs (P<0.01).

In PD patients the "energy and fatigue" (p<0.001) and "negative feelings" (p<0.002) facets and all facets of the level-of-independence domain (p<0.0001) had more impact on QOL compared with OA patients. The loss of adaptation of complex movements in PD patients is related to cognitive processing. Comparison by means of a generic and not a disease-specific QOL measure allows us to state that impaired mobility in PD and OA lead to major changes in QOL. The data showed that patients with PD had lower QOL scores (measured with the WHOQOL-100) in all domains compared with OA patients and healthy adults of the same age. Physical factors, such as pain (discomfort) and energy, were most affected in these patients. Particular issues are of great concern to these groups of patients. Whitehurst [19] showed that in patients with neurological disease, social interaction is affected first.

Patients with arthritis score the lowest on physical function scales (pain scale) [1,20,21]. According to Archenholtz [20], in telephone interviews using open-ended questions, patients with arthritis were mostly dissatisfied with areas of their lives that threatened their independence.

Persons who have chronic health conditions are especially vulnerable to pain, depression, and anxiety. Angermeyer's [22] findings suggest a close association between changes in the severity of the depressive disorder and the psychological domain

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Table 3. Correlation coefficients (Cronbach's alpha) for the facets and domains of the WHOQOL and overall quality of life for the three respondents' groups.

Domains of WHOQOL-100	Facets	Parkinson's disease	Osteoarthritis	Control group
I. Physical capacity	1. Pain and discomfort	0.783	0.463	0.545
	2. Energy and fatigue	0.812	0.662	0.488
	3. Sleep and rest	0.679	0.309	0.306
	Total	**0.815**	**0.581**	**0.572**
II. Psychological health	4. Positive feelings	0.832	0.669	0.506
	5. Thinking, learning, memory, and concentration	0.785	0.666	0.411
	6. Self-esteem	0.838	0.512	0.426
	7. Bodily image and appearance	0.343	0.372	0.509
	8. Negative feelings	0.744	0.553	0.562
	Total	**0.845**	**0.697**	**0.658**
III. Level of independence	9. Mobility	0.729	0.583	0.240
	10. Activities if daily living	0.780	0.642	0.416
	11. Dependence on medication and treatment	0.670	0.601	0.236
	12. Working capacity	0.796	0.603	0.399
	Total	**0.794**	**0.694**	**0.408**
IV. Social relationships	13. Personal relationship	0.625	0.648	0.690
	14. Social support	0.224	0.597	0.497
	15. Sexual activity	0.753	0.630	0.405
	Total	**0.695**	**0.715**	**0.645**
V. Environment	16 Physical safety	0.564	0.343	0.587
	17. Home environment	0.459	0.593	0.564
	18. Financial resources	0.393	0.374	0.585
	19. Health and social care	0.365	0.345	0.575
	20. Opportunities for acquiring new information and skills	0.636	0.550	0.622
	21. Participation in and opportunities for recreation/leisure activities	0.703	0.698	0.556
	22. Physical environment (pollution, noise, traffic, climate)	0.529	0.197	0.523
	23. Transportation	0.576	0.416	0.601
	Total	**0.649**	**0.687**	**0.758**
VI. Spiritual domain	24. Spirituality/Religion/Personal beliefs	0.525	0.480	0.375

of QOL. According to Angermeyer, the environmental domain is not associated with depression since it includes, except for leisure, facets unaffected by depression. It is well known that dementia is more common in older patients with PD. Some studies found that worse mood (as indicated by depression and fatigue scores) is characteristic of PD patients [12].

No significant differences in overall QOL and health were observed between PD, OA, and the control group, although analysis of the scores for the separate domains and facets revealed statistically significant group differences. The different quality of life in the OA and PD patients in this study was reflected in the domain scores of the WHOQOL. The

average scores for the respondents in the PD group were significantly lower than those for the OA group in the facet of "energy and fatigue" of the physical-capacity domain, "negative feelings" in the psychological-health domain, all facets of the level-of-independence domain, and the facets of "opportunities for acquiring new information" and "transportation" in the environment domain. In nearly all the sub-scales of the WHOQOL there were significant differences between PD and CG.

Two disease-specific quality-of-life measures for PD patients are available: PDQ-39 [10] and PDQL [13]. They focus on the most distressing symptoms reported be PD patients.

The poorer quality of life of PD patients as measured by the WHOQOL-100 was found to be significantly associated with the level-of-independence and physical-capacity domains. A highly impaired level of independence was more common among women with Parkinson's disease than in other patients.

Other studies also found that older people with arthritis have decreased QOL [23,24]. 70.6% had some or frequent mobility problems measured with EuroQOL [25]. According to Laborde and Powers [23], patients with OA rated their current life satisfaction and health as relatively good, but they also reported that high life satisfaction was related to less joint pain and not disturbed mobility. Health care specialists are most interested in the subcomponent of QOL which has been termed health-related QOL [2,25–34]. It was found when studying older people that a social network and support increased their well-being and QOL [4,29,30,35]. When the patient's condition is incurable, such support should be sought to ensure the best possible QOL for the patient.

The obtained results indicate that the generic WHOQOL questionnaire discriminated between PD and OA patients, was sensitive to some aspects of patients' QOL perception and multidimensional problems, and was able to differentiate between PD and OA patients in the level-of-independence domain and those facets we might expect to be mostly affected by the disease.

CONCLUSIONS

With respect to all facets of the level-of-independence domain, "energy and fatigue" of the physical domain, and three facets of the environment domain, the Parkinson's disease and osteoarthritis groups showed the most changes in the WHOQOL-100 domains. Impairment of QOL included more aspects of QOL in Parkinson's disease than in osteoarthritis patients. In Parkinson's disease, all facets of the level-of-independence domain were major problems. The analyses revealed that patients with Parkinson's disease on average scored lowest on the affected scales.

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