Research Article

The Health-related Quality of Life of Sudanese Patients with Idiopathic Parkinson’s Disease - ⚫

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ABBREVIATIONS

IPD: Idiopathic Parkinson’s Disease; PD: Parkinson’s Disease; HrQoL: Health-related Quality of Life; HTN: Hypertension; DM: Diabetes Mellitus; RF: Renal Failure; SF-36: Short Form Health Survey-6 items; ADL: Activity of Daily Living; PDQ-39: Parkinson’s Disease Questionnaire-39 items

INTRODUCTION

Idiopathic Parkinson’s Disease (IPD) is a chronic and progressive neurodegenerative condition with no known cure. It affects approximately 1-2 % of people over the age of 60 years and about 3-5 % of those 80 years and older [1]. IPD where manifested by motor and non-motor features is the result of the loss of dopamine-producing brain cells [2].

The complex of motor and non-motor symptoms in addition to individual living factors e.g., rural vs. metropolitan has a significant impact not only on patients but also on their spouses and partners. As the disease progresses, both the individuals with PD and their spouses/partners often undergo thedifficult challenge of adapting to living factors eg., rural economic consequences, all of which affect satisfaction with life of both groups [3,4].

This wide spectrum of influences has brought growing attention to focus on these aspects of living and not merely to the physical well-being of the patients.

To date, there have been several studies that have separately evaluated the various influences of the disease’s motor and non-motor symptoms on the patients’ HrQoL. However, few of them have assessed the contribution of other overlooked factors such as social support, self-esteem, optimism, spirituality, and the economic burden of the disease [5,6]. Furthermore, there is scarcity of studies that evaluate the changes in HrQoL domains with time during further follow-up assessments.

Therefore, Health-related Quality of Life (HrQoL) has been considered as an important outcome indicator for management, care, and progression of IPD [7]. Moreover, increased life expectancy owing to the emergence of new treatment options in IPD addresses the importance of HrQoL in the follow-up of IPD patients [8]. In Sudan, there’s little known about the prevalence of IPD. However, it is predicted to be increasing. There’s no published data despite the paramount importance of evaluating HrQoL among adult Sudanese patients. This study may add to the knowledge of movement disorders in Sudan by addressing the issue of IPD through the exploration of HrQoL profile among adult Sudanese patients.

MATERIALS AND METHODS

Study design

A descriptive, cross-sectional, clinic-based multicenter research study. The study was conducted in three neuroscience centers in Khartoum city, namely, Ibrahim Malik neuroscience center, Bashayer University Hospital and Soba University Hospital. The study covered a period of eight months from January 2018-August 2018. A total of 34 patients were recruited for the study comprising all patients with Idiopathic Parkinson’s disease attending the neurology outpatient clinics during the study period.

Inclusion criteria

- A diagnosis of IPD that was made by a neurologist.
- Age > 18 yrs.
- Duration of the disease > 1 yr.

Exclusion criteria

- Vascular Parkinson or Parkinson’s plus syndrome.
- Other uncontrolled co-morbidities e.g. HTN, DM, RF, hepatic failure, etc.
- Patients diagnosed with psychiatric illness prior to IPD diagnosis.
- Patients who refuse to participate in the study.

Description of the data collection tools

The study used two types of assessment forms both are in Arabic language. The data collectors were acquainted to the terminologies of each form. A patient assessment form was completed for each participant. The form includes non-modifiable variables such as the age, gender,
and the level of education. In addition to the occupational status, disease duration and list of the drugs prescribed for the disease.

A health-related quality of life questionnaire was completed for each participant; the instrument used is the Medical outcome study 36-items Short Form health survey (SF-36). The Arabic version was used in this study.

The participants were interviewed in the outpatient clinics upon their attendance for follow up, other participants were interviewed later through the phone.

Data analysis

The collected data was analyzed using Statistical Package for the Social Sciences Software (SPSS) version 21. ANOVA test was used to assess the correlation between the HrQoL and the independent variables. Significance was set at $p < 0.05$. The results are represented in form of tables and figures.

RESULTS

The sample consisted of 34 patients who fulfilled the inclusion criteria for the study. The age ranges from a minimum of 31 to more than 60 years, 58.8% of the participants were of more than 60 years of age (Table 1).

The studied group showed a predominance of male gender (24 patients, 70.6%) and 10 females (29.4%). The age difference between the genders as follows: seven of the females (70%) were in the age range of 31-60 years compared to 7 males (29.2%). While 70.8% of the males (17 patients) were of more than 60 years of age compared to only three females (30%) (Figure 1).

As with regards to the educational level of the subjects, 11 patients (32.4%) had formal education at schools, 10 patients (29.4%) had non-formal education at Khalowa, 7 patients (20.6%) were illiterate, and only six patients out of 34 (17.6%) were university graduates. The variation in the educational level across genders is explained (Figure 2).

Of the 34 patients studied, only seven patients (20.6%) were still working and able to carry on their regular occupations. While in a predominance of 11 patients (32.4%) they had to stop working or changed their occupation because of the disease (Table 2).

Regarding the duration of the disease, it was two to four years in 17 patients (50%), five to ten years in nine patients (26.5%), while in eight patients (23.5%) the duration of the disease was more than 10 years. Figure 3 shows the distribution of disease durations among the genders.

Only five patients (14.7%) were on monotherapy with Levodopa, the rest of the 29 patients (85.3%) were receiving both Levodopa and antimuscarinic treatment for the disease.

Concerning the summary score of the health-related quality of life questionnaire (SF-36), the total SF-36 scores of the study group ranged from 12.9 to 87.5 with a mean value of $(53.1 \pm 17.7)$. The summary scores for each eight domains of the SF-36 were calculated as well for each participant. The mean summary scores of the eight SF-36 domains are tabulated (Table 3). Lowest mean value (worse outcome) was in the domain of role limitation due to physical health problems $(25 \pm 35.3)$, while it was highest at the domain of mental health $(72 \pm 14)$ indicating better outcome. It is worth mentioning that the SF-36 scale provides a score range from 0-100 with high scores indicating better outcome and vice versa; but it does not provide any cut off values to stratify the score into categorized good or poor outcomes, nevertheless, in the reviewed literature of this study; the summary index score of either the disease specific measures or the generic SF-36 was tested in an univariate or multivariate regression analysis, in addition to prediction tests. However, in our study and because of the small sample size these statistical tests are inapplicable. Instead, to describe the HrQoL status of our study sample we thought to improvise a construct of stratification method to categorize the studied patients into four groups based on their total SF-36 summary scores: very poor, poor, reasonable, and good. Table 4 summarizes the arbitrary of the quality of life status based on the total SF-36 score. According to this construct, the mean value of the total SF-36 score $(53.1 \pm 17.7)$ categorizes our study group as having (Reasonable) health-related quality of life status.

Among the participants, the physical functioning domain subscores were ranging from 0-90, three patients (8.8%) scored zero,
Regarding the domain of vitality, the scores ranged from 15-90. Of the 34 subjects, only one patient (2.9%) did score 15, six patients (17.6%) had a score of 45, (14.7%) of the patients scored 30, another (14.7%) of patients had a score of 55, four patients (11.8%) scored 35, (8.8%) of the patients scored 50 , while another (8.8%) of patients scored 80, (5.9%) of the participants scored 40 , and the highest score 90 was achieved by another (5.9%) of the study subjects.

In the mental health domain, the subscores ranged 44 -92, one patient scored 44, and four patients (11.8%) scored 92, the majority of (23.5%) of the patients studied had a score of 76 in this particular domain.

As for the social functioning domain, the subscores ranged from 0-100. Four patients (11.7%) scored less than 20, two patients (5.9%) scored 38, eight patients (23.5%) scored 50, six patients (17.6%) scored 63, five patients (14.7%) scored 75, four patients (11.8%) scored 88, and three patients (8.8%) scored 100.

Concerning the subscores of the general health perception domain, the range found was 5-100, two patients (5.8%) had a score less than 30, 16 patients (47.2%) scores ranged from 31-60, seven patients (20.6%) scored 65, four patients (11.8%) scored 70, and five patients (14.6%) their scores ranged from 75-100.

In order to identify the determinants of HrQoL, the correlation is tested between the independent variables and the mean value of total SF-36 score. However, the test also detected statistically significant correlations when using the mean scores of each eight domains of the SF-36.

Table 2: The occupational status among the studied patients.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working</td>
<td>7</td>
<td>20.6</td>
</tr>
<tr>
<td>Changed or Stop working due to health situation</td>
<td>11</td>
<td>32.4</td>
</tr>
<tr>
<td>Retired</td>
<td>6</td>
<td>17.6</td>
</tr>
<tr>
<td>Not working</td>
<td>3</td>
<td>8.8</td>
</tr>
<tr>
<td>House wife</td>
<td>7</td>
<td>20.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 3: The mean summary scores of the total SF-36 score and the eight domains subscores.

<table>
<thead>
<tr>
<th></th>
<th>Physical functioning</th>
<th>Role limitation due to physical health problems</th>
<th>Role limitation due to emotional problems</th>
<th>Vitality</th>
<th>Mental health</th>
<th>Social functioning</th>
<th>Bodily pain</th>
<th>General health perception</th>
<th>Total SF-36 score</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Valid</td>
<td>Valid</td>
<td>Valid</td>
<td>Valid</td>
<td>Valid</td>
<td>Valid</td>
<td>Valid</td>
<td>Valid</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Mean</td>
<td>46.912</td>
<td>25.000</td>
<td>51.971</td>
<td>50.147</td>
<td>72.000</td>
<td>57.941</td>
<td>64.588</td>
<td>56.765</td>
<td>53.129</td>
</tr>
<tr>
<td>Minimum</td>
<td>.0</td>
<td>.0</td>
<td>.0</td>
<td>15.0</td>
<td>44.0</td>
<td>.0</td>
<td>.0</td>
<td>5.0</td>
<td>12.9</td>
</tr>
<tr>
<td>Maximum</td>
<td>90.0</td>
<td>100.0</td>
<td>100.0</td>
<td>90.0</td>
<td>92.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>87.5</td>
</tr>
</tbody>
</table>

Table 4: Distribution of HrQoL status among study sample.

<table>
<thead>
<tr>
<th>HrQoL status /total SF-36 score</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very poor ( Less than 25)</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>Poor (25 up to 49)</td>
<td>14</td>
<td>41.2%</td>
</tr>
<tr>
<td>Reasonable (50 up to 74)</td>
<td>15</td>
<td>44.1%</td>
</tr>
<tr>
<td>Good ( more than 75)</td>
<td>4</td>
<td>11.8%</td>
</tr>
</tbody>
</table>

(HrQoL: Health-related Quality of Life, SF-36: Short Form health survey-36 items)
In this study, age was not found to be of statistical significance in correlation with the mean of total SF-36 score \( (p = 0.41) \), or with the calculated mean of any of the eight domains (Table 5).

On the other hand, gender showed a significant correlation with the total SF-36 score \( (p = 0.02) \), high mean value found in male gender 57.5 ± 16.6 versus 42.6 ± 16.4 in females. Across the eight domains, the gender was found to be of significant association with the mean scores in both of the physical functioning \( (p = 0.001) \) and social functioning \( (p = 0.04) \) domains (Table 6). As for the physical functioning, the total mean of 46.9 ± 23.8 was found, with 55.2 ± 20.4 for males versus 27 ± 19.6 for females. While regarding the social functioning, the total mean was 57.9 ± 26.6 with lower value representing the females 42.8 ± 28.3 compared to 64.2 ± 23.7 for males.

### Table 5: Differences in Health-related Quality Of Life (HrQoL) among age groups.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Physical functioning</th>
<th>Role limitation due to physical health problems</th>
<th>Role limitation due to emotional problems</th>
<th>Vitality</th>
<th>Mental health</th>
<th>Social functioning</th>
<th>Bodily pain</th>
<th>General health perception</th>
<th>Total SF - 36 score</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 up to 40</td>
<td>N 1</td>
<td>.000</td>
<td>.000</td>
<td>40.000</td>
<td>76.000</td>
<td>13.000</td>
<td>10.000</td>
<td>55.000</td>
<td>25.500</td>
</tr>
<tr>
<td></td>
<td>Mean 10.000</td>
<td>.000</td>
<td>.000</td>
<td>76.000</td>
<td>13.000</td>
<td>10.000</td>
<td>55.000</td>
<td>25.500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>41 up to 50</td>
<td>N 5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Mean 52.000</td>
<td>35.000</td>
<td>73.400</td>
<td>42.000</td>
<td>71.200</td>
<td>65.200</td>
<td>76.200</td>
<td>57.000</td>
<td>58.960</td>
</tr>
<tr>
<td>51 up to 60</td>
<td>N 8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Mean 53.750</td>
<td>37.500</td>
<td>50.000</td>
<td>57.500</td>
<td>65.000</td>
<td>47.125</td>
<td>60.125</td>
<td>58.125</td>
<td>53.600</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>21.8354</td>
<td>44.3203</td>
<td>19.5667</td>
<td>31.1331</td>
<td>30.8982</td>
<td>15.7973</td>
<td>22.7075</td>
<td></td>
</tr>
<tr>
<td>More than 60 years</td>
<td>N 20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Mean 44.750</td>
<td>18.750</td>
<td>50.000</td>
<td>49.750</td>
<td>74.800</td>
<td>62.700</td>
<td>66.200</td>
<td>56.250</td>
<td>52.865</td>
</tr>
<tr>
<td>Total</td>
<td>N 34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Mean 46.912</td>
<td>25.000</td>
<td>51.971</td>
<td>50.147</td>
<td>72.000</td>
<td>57.941</td>
<td>64.588</td>
<td>56.765</td>
<td>53.129</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>23.8052</td>
<td>35.3553</td>
<td>14.0992</td>
<td>26.6378</td>
<td>29.4866</td>
<td>17.7475</td>
<td>17.7581</td>
<td></td>
</tr>
<tr>
<td>( p ) value</td>
<td>0.037</td>
<td>0.489</td>
<td>0.507</td>
<td>0.49</td>
<td>0.43</td>
<td>0.158</td>
<td>0.22</td>
<td>0.03</td>
<td>0.41</td>
</tr>
</tbody>
</table>

(HrQoL: Health-related Quality of Life, SF-36: Short Form health survey-36 items, Std. Deviation: Standard Deviation, Sig: Significant)

### Table 6: Differences in Health-related quality of life (HrQoL) among gender.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Physical functioning</th>
<th>Role limitation due to physical health problems</th>
<th>Role limitation due to emotional problems</th>
<th>Vitality</th>
<th>Mental health</th>
<th>Social functioning</th>
<th>Bodily pain</th>
<th>General health perception</th>
<th>Total SF - 36 score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>N 24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Mean 55.208</td>
<td>27.083</td>
<td>58.333</td>
<td>52.500</td>
<td>73.833</td>
<td>64.250</td>
<td>69.958</td>
<td>59.167</td>
<td>57.508</td>
</tr>
<tr>
<td>Female</td>
<td>N 10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Mean 27.000</td>
<td>20.000</td>
<td>36.700</td>
<td>44.500</td>
<td>67.600</td>
<td>42.800</td>
<td>51.700</td>
<td>51.000</td>
<td>42.620</td>
</tr>
<tr>
<td>Total</td>
<td>N 34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Mean 46.912</td>
<td>25.000</td>
<td>51.971</td>
<td>50.147</td>
<td>72.000</td>
<td>57.941</td>
<td>64.588</td>
<td>56.765</td>
<td>53.129</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>23.8052</td>
<td>35.3553</td>
<td>14.0992</td>
<td>26.6378</td>
<td>29.4866</td>
<td>17.7475</td>
<td>17.7581</td>
<td></td>
</tr>
<tr>
<td>( p ) value</td>
<td>0.001 significant</td>
<td>0.60 Not significant</td>
<td>0.215 Not significant</td>
<td>0.26 Not significant</td>
<td>0.24 Not significant</td>
<td>0.03 Not significant</td>
<td>0.10 Not significant</td>
<td>0.22 Not significant</td>
<td>0.02 significant</td>
</tr>
</tbody>
</table>

(HrQoL: Health-related Quality of Life, SF-36: Short Form health survey-36 items, Std. Deviation: Standard Deviation, SF-36: Short Form health survey-36 items)
The level of education has also shown a significant correlation with the mental health domain of the SF-36 (\(p = 0.04\), Mean = 72 ± 14), the highest mean was found in those who were non-formally educated at Khalowa 81.2 ± 10.1, and the lowest was in the category of school education 64 ± 15.4. Though the educational levels were not shown to be contributory when correlation was tested to the total SF-36 score (\(p = 0.82\)) (Table 7).

As for the occupational status, this was found to be only contributing to the physical functioning domain of the SF-36 scale (46.9 ± 23.8, \(p = 0.007\)) compared to the total SF-36 score (53.1 ± 17.7, \(p = 0.54\)). In this category, the range of the mean was highest for patients who are still working (65.7 ± 16.1) and lowest for the housewife category (25.7 ± 16.4) (Table 8).

The duration of the disease was also correlated with changes in the domain of general health perception (56.7 ± 17.7, \(p = 0.04\)) compared to the total SF-36 score (53.1 ± 17.7, \(p = 0.36\)) compared to the total SF-36 score (\(p = 0.36\)), the range of the mean was 45 ± 17.5-71.2 ± 14 being the highest at patients who suffer for more than 10 years, and lowest at those whom durations ranged at 5-10 years (Table 9).

**DISCUSSION**

This study is the first study in our country that evaluates Health-related Quality of Life (HrQoL) as an outcome in patients with chronic illness, specifically those with neurodegenerative disorders. Our primary objective was to evaluate the HrQoL profile of the studied patients, and the secondary objectives were to identify the different determinants and assessment of the burden of each. In this study, we thought to evaluate the HrQoL by using the generic SF-36 scale as it is more relevant to the activities of day-to-day life; moreover it can also provide results comparable to HrQoL of the general population or other patients with different chronic illnesses.

From the socio-demographic characteristics of the studied patients, the majority of patients were of more than 60 years of age and the duration of the disease since diagnosis is 2-4 years 58.8% and 50% respectively. In this study, age did not contribute to any significant changes in HrQoL which is in keeping with the findings of some previous studies [9-12] even though these studies used different HrQoL measures. The smaller sample size and the predominance of older age groups in this study may have limited the chances to detect significant changes between different age groups. On the other hand, the disproportion between the advancing age and the duration of disease may highlight a possibility of delayed diagnosis for reasons that include limited access to health services or due to previous misdiagnosis.

Our study showed that the disease duration did not contribute directly to HrQoL, but rather indirectly through the domain of general health perception which was surprisingly worse in patients with duration of 5-10 years and better in those who suffer for more than 10 years; this is probably because patients of more prolonged disease duration may have developed better coping strategies and thence a reasonably better general health perception. Previously published evidence shows conflicting results on this issue [12,13] where the summary indices of the used HrQoL scales were in direct association with disease duration.

In concordance with other researches [7,14], our data revealed that gender affirms a significant correlation with poor HrQoL total

### Table 7: Differences in Health-related quality of life (HrQoL) with the level of education.

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Physical functioning</th>
<th>Role limitation due to physical health problems</th>
<th>Role limitation due to emotional problems</th>
<th>Vitality</th>
<th>Mental health</th>
<th>Social functioning</th>
<th>Bodily pain</th>
<th>General health perception</th>
<th>Total SF-36 score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illiterate</td>
<td>N</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>42.143</td>
<td>14.286</td>
<td>61.857</td>
<td>50.000</td>
<td>72.571</td>
<td>50.143</td>
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<td>72.000</td>
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(HrQoL: Health-related Quality of Life, SF-36: Short Form health survey-36 items, Std. Deviation: Standard Deviation)
### Table 8: Differences in Health-related quality of life (HrQoL) with the occupational status.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Physical functioning</th>
<th>Role limitation due to physical health problems</th>
<th>Role limitation due to emotional problems</th>
<th>Vitality</th>
<th>Mental health</th>
<th>Social functioning</th>
<th>Bodily pain</th>
<th>General health perception</th>
<th>Total SF - 36 score</th>
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<td>66.143</td>
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<td>16.6783</td>
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</tr>
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<td>50.147</td>
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<td>57.941</td>
<td>64.588</td>
<td>56.765</td>
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<td>0.60</td>
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</table>

(HrQoL: Health-related Quality of Life, SF-36: Short Form health survey-36 items, Std. Deviation: Standard Deviation, Sig: Significant)

### Table 9: Differences in Health-related quality of life (HrQoL) with the disease duration.

<table>
<thead>
<tr>
<th>Duration of disease</th>
<th>Physical functioning</th>
<th>Role limitation due to physical health problems</th>
<th>Role limitation due to emotional problems</th>
<th>Vitality</th>
<th>Mental health</th>
<th>Social functioning</th>
<th>Bodily pain</th>
<th>General health perception</th>
<th>Total SF - 36 score</th>
</tr>
</thead>
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<td>67.765</td>
<td>53.118</td>
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<td>52.365</td>
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<td>30.7447</td>
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<td>5 up to 10 years</td>
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<td>9</td>
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<tr>
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<td>58.889</td>
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<td>7.9821</td>
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<td>3</td>
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<tr>
<td>Mean</td>
<td>46.912</td>
<td>25.000</td>
<td>51.971</td>
<td>50.147</td>
<td>72.000</td>
<td>57.941</td>
<td>64.588</td>
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<td>53.129</td>
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<td>P value</td>
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<td>0.16 Not</td>
<td>0.07 Not</td>
<td>0.30 Not significant</td>
<td>0.81 Not</td>
<td>0.006 Significant</td>
<td>0.36 Not significant</td>
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</table>

(HrQoL: Health-related Quality of Life, SF-36: Short Form health survey-36 items, Std. Deviation: Standard Deviation)
score especially being worse in females. Although it is believed that the worse quality of life in women with a chronic disease is generally resulted from the higher burden of depression and anxiety [7]. However, not all the eight domains of SF-36 were similarly affected; our report shows that female gender has significant effect on both physical functioning and social functioning domains summary scores. This selective impact on specific quality of life areas raises concerns on whether female patients are more prone to lack of social support and social isolation compared to male patients, or whether this is due to more interpersonal factors such as low self-esteem or stigma. In contrast to the reported finding in previous studies [15,16] pain was not significantly prevalent in women nor did it show any direct effect on HrQoL, whereas this result was in line with other researches [17,18] where a history of pain did not condition a significant differences in quality of life scores.

From the reviewed literature for this study, several studies had identified the level of education as one of the personal factors to have an impact on quality of life; poor outcomes were correlated with lower levels of education. However, our findings failed to point out this direct relationship; rather it showed only an indirect effect on HrQoL through the mental health domain (p = 0.04). Interestingly, our results have shown higher mean scores in patients with lower level of education which represent better mental health (Khalowa 81.2 ± 10.1, and illiterates 72.5 ± 10.4), it is thought this could be in fact a reflection of their limited expectations of life where their needs are not very high.

As the disease advances, one of the difficult challenges that IPD patients suffer is to maintain their usual lifestyles, independence, and the support system they provide their families with. The occupational status has been one of these challenging sides. Our study has successfully addressed this aspect by identifying a significant correlation with the physical functioning domain of the SF-36 (p = 0.007), also the results showed a predominant frequency of patients who changed or quit their occupations due to the disease (32.4% of the participants) which is in agreement with the evidence published by Winter Y, et al. [13] in a cross-sectional study evaluating HrQoL of 100 IPD patients matched with 100 controls, the study revealed that among 19 prematurely retired patients, 10 (52.6%) were prematurely retired due to PD. These findings emphasize the role of occupational therapy in the multidisciplinary treatment strategy for IPD patients.

In our study role limitation due to physical health problems was the dominantly affected area of HrQoL with worst subscore, and consequently identified as an independent determinant. This evidence reflects the daily challenges the patients face especially in those who suffer from increasing physical disabilities, also it supports the reported correlation between the physical component of the generic SF-36 and the domain of mobility and Activity of Daily Living (ADL) in the disease-specific PDQ-39 scale as concluded by Xiao-Jing and colleagues [9]. Moreover, our result represents accordance with the findings from several literatures in this study [11,12,18,19] where the ADL profile was one of the factors predicted poor quality of life in the studied groups.

Although we adopted a quantitative construct for this study, during the interviews the participants had discussed wide ranges of difficulties and daily challenges they suffer because of the disease. This should raise interest in using combined methods of qualitative and quantitative constructs when addressing HrQoL in further studies.


