

**ORIGINAL ARTICLE**

**HEALTH RELATED QUALITY OF LIFE (HRQOL) AMONG STROKE SURVIVORS ATTENDING REHABILITATION CENTRES IN SELANGOR**

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**ABSTRACT**

**Background :** A cross-sectional survey was carried out in December 2007 to compare the health-related quality of life (HRQoL) of stroke survivors with that of general Malaysian population.

**Methodology :** Stroke patients were recruited from two community-based rehabilitation centres in Selangor. HRQoL was assessed using Medical Outcome 36-Item Short-Form Health Survey (SF-36).

**Result :** A total of 61 patients (34 males and 27 females) were interviewed. Majority were Chinese (85%) and a small percentage were Malays (15%). 82% (n=50) were elderly of 60 years and above, and the remaining 18% (n=11) were younger patients. 64% had stroke for one year and more, and 36% were less than a year post-stroke. All subjects were community-dwellers and lived with their families. The result showed that with the exception of bodily pain, the mean score of all SF-36 health domains of stroke patients were lower than that of the general population. The greatest difference was in role physical, followed by physical functioning. Female patients demonstrated higher score than the males in all SF-36 domains, in particular general health (57.2 vs 70.3, p=0.01) and social functioning (52.2 vs 73.1, p=0.00). There were no differences of HRQoL domains after comparison according to post-stroke duration (all p>0.05).

**Conclusion :** HRQoL of stroke survivors is lower than that of Malaysian general population in all SF-36 health domains, with the exception of bodily pain.

**Keywords :** Stroke, Health-Related Quality Of Life, SF-36, Rehabilitation.

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## **INTRODUCTION**

It is well established that despite rehabilitation, most stroke survivors live with long term disability, ranging from mild to severe. The Global Burden of Disease Study, which was conducted in 2004 by the World Health Organisation (WHO) reported that the prevalence of moderate and severe disability due to stroke was 12.6 million worldwide, out of which 8.9 million occurred in the developing countries and 3.6 million was in the developed countries<sup>1</sup>. Post-stroke disability is also more prevalent among stroke survivors of age 60 years and above (7.1 million) than the younger age group (5.4 million) and more predominant among women<sup>1</sup>.

Disability, either moderate or severe has substantial impact on the stroke survivors' health-related quality of life (HRQoL). Other factors that have been found to be strongly associated with lower HRQoL amongst the stroke survivors include depression<sup>2,3,4</sup>, anxiety<sup>4</sup>, cognitive impairment<sup>5</sup>, post-stroke fatigue<sup>4</sup>, and advancing age<sup>6</sup>. Effects of disability and all these factors on HRQoL have also been noted across multiple domains of functioning<sup>7</sup>.

Studies on HRQoL amongst stroke populations are well established in the Western countries<sup>6,8,9,10</sup> and some Eastern countries<sup>11,12</sup>. In general, most studies found lower HRQoL scores amongst stroke survivors when compared with general populations<sup>6,8,9,10</sup>. Interestingly, Kong and Yang<sup>11</sup>, reported that HRQoL of stroke survivors in Singapore was comparable with the general Singaporean population. In their study, the stroke survivors were recruited from a rehabilitation hospital, reflecting possible positive effects of the rehabilitation process on stroke.

HRQoL in stroke patients have not been investigated in Malaysia. As in many other developing countries, the incidence of stroke and stroke mortality is high in Malaysia. Stroke ranks fifth among the top ten leading causes of deaths in Malaysian public hospitals<sup>13</sup>. Approximately 52,000 people suffered strokes annually, with deaths from stroke in the public hospitals ranging between 8.19% to 9.27% each year since 2000<sup>13</sup>. Recognizing the significance of stroke in Malaysia, more studies on the outcome of this disease including HRQoL, are needed. This study was therefore, aimed to measure the HRQoL of stroke survivors attending rehabilitation centres in a heavily populated country in Malaysia, i.e. Selangor, to compare the HRQoL score of stroke with that of the general Malaysian population and further to compare the stroke survivors' HRQoL score based on gender and post-stroke duration.

## **METHODOLOGY**

### **Patient Enrollment**

This was a quantitative cross-sectional survey of HRQoL of stroke survivors living in Selangor in December 2007. Stroke subjects were recruited via convenience sampling method from two community-based rehabilitation centres in Petaling Jaya and Ampang. The inclusion criterias were first ever stroke diagnosed radiographically via Magnetic Resonance Imaging or Computer-assisted Tomography Scan, good cognitive function (Mini Mental State Examination 24-30) and ability to communicate without much difficulties. Those who were aphasic, depressed, have recurrent or bilateral stroke, and sustained physical disabilities prior to stroke were excluded from the study.

### **Study Locations**

Two community-based rehabilitation centres, one in Petaling Jaya and another in Ampang, which were run by the National Stroke Organisation of Malaysia (NASAM) were selected as study locations. NASAM centres provide rehabilitation services to stroke survivors living in the community, education and supportive counseling to family members of stroke survivors and conduct regular forums to increase public awareness on stroke. NASAM centres in Petaling Jaya and Ampang were selected as these centres catered for stroke survivors who lived in Selangor.

### **Measurement of HRQoL**

HRQoL was measured using Medical Outcome Survey Short Form 36 (SF-36)<sup>14</sup>. SF-36 is a 36-questions questionnaire which covers eight health-related domains. Physical functioning (10 items) assesses limitations in physical activities, such as walking and climbing stairs. The role physical (4 items) and role emotional (3 items) domains measure problems with work or other daily activities as a result of physical health or emotional problems. Bodily pain (2 items) assesses limitations due to pain, and vitality (4 items) measures energy and tiredness. The social functioning domain (2 items) examines the effect of physical and emotional health on normal social activities, and mental health (5 items) assesses happiness, nervousness and depression. The general health perceptions domain (5 items) evaluates personal health and the expectation of changes in health. All domains are scored on a scale from 0 to 100, with 100 representing the best possible health state. The scores of these

eight domains can also be summated into two major categories – Physical Composite Score (PCS) and Mental Composite Score (MCS) to reflect overall physical and mental health, respectively. SF-36 has been validated in the evaluation of quality of life in stroke population<sup>15</sup>. Apart from the Nottingham *Health* Profile, SF-36 is also the most frequently used quality of life measures in neurology<sup>16</sup>. Normal scores are available for the general Malaysian population for comparison<sup>17</sup>. Subjects who have problem understanding English were guided during completing the questionnaire. All subjects received an information sheet and signed an informed consent form prior to participating in the study. Ethical approval was granted by the Research and Ethic Committee of Universiti Kebangsaan Malaysia.

**Data Analysis**

Data obtained was entered into SPSS version 14 software and analysis was conducted using

descriptive statistics for demographic data and independent t-test for comparison between subgroups of gender and duration of stroke onset. Level of significance was set at  $p < 0.05$ .

**RESULT**

A total of 61 stroke subjects consented for the study and completed the SF-36 questionnaire. Table 1 shows the demographic characteristics of the subjects. 18% (n=11) of the subjects were below 60 years and 82% (n=50) were 60 years and above. Out of 61, 56% (n=34) were male and 44% (n=27) were female. Majority of the subjects were Chinese (85%, n=52) and a small percentage were Malays (15%, n=9). Accordingly, 90% (n=55) of the subjects were married and only 10% (n=6) were unmarried. The proportions of subjects with stroke onset below one year and those of one year and above were 36%(n=22) and 64%(n=39) respectively. All subjects were community-dwellers and lived with their families.

**Table 1 Demographic Characteristics of the Subjects**

Demographic characteristics		N (Total = 61)	%
Age (yr)	< 60	11	18
	≥ 60	50	82
Gender	Male	34	56
	Female	27	44
Ethnicity	Malay	9	15
	Chinese	52	85
	Indian / others	0	0
Marital status	Married	55	90
	Not married	6	10
Post-stroke duration (yr)	< 1	22	36
	≥ 1	39	64

Scores of health-related quality of life of the stroke subjects compared to that of general Malaysian population is demonstrated in Figure 1. With the exception of bodily pain, the mean scores for all health domains were lower in the stroke subjects than that of the general population. The greatest differences were in role physical, i.e. 51.6 for the stroke subjects compared to 82.0 for the general population; followed by physical functioning 60.1 for the

stroke subjects compared to 86.0 for the general population, and role emotion 54.1 for the stroke subjects and 79.2 for the general population. The mean PCS and MCS were 44.1 ( $\pm 10.1$ ) and 44.5 ( $\pm 10.9$ ) respectively for the stroke subjects, however due to unavailability of the PCS and MCS data for the general population, these scores could not be compared.

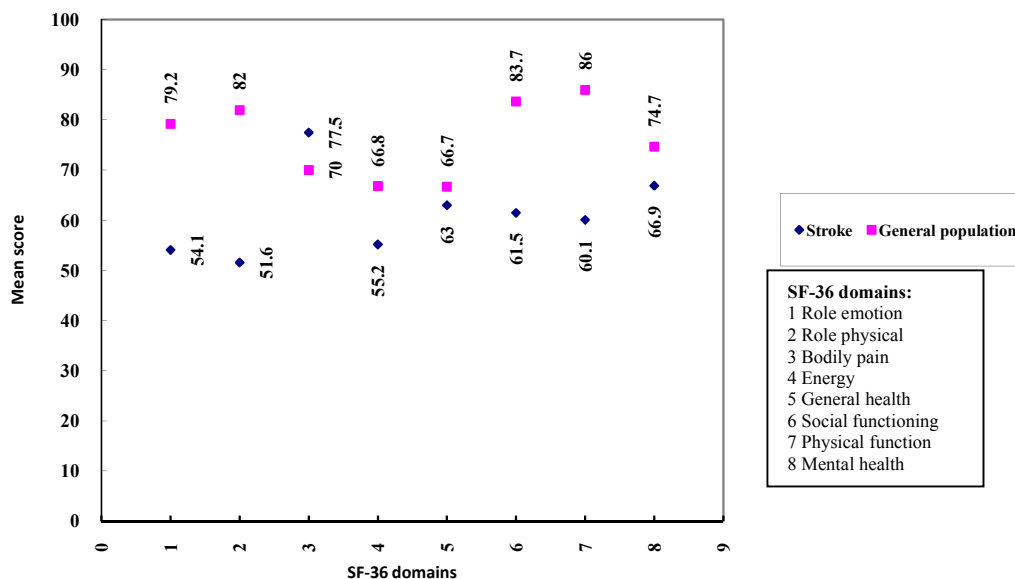


Fig. 1 SF-36 Scores Between the Stroke Subjects and General Malaysian Population

Independent t-test was used to determine the differences in SF-36 score based on gender and post-stroke duration. Results are shown in Table 2 and 3. There were significant differences in the SF-36 scores between the male and the female subjects in general health (57.2 vs 70.3,  $p=0.01$ ) and social functioning (52.2 vs 73.1,  $p=0.00$ ). The female subjects also demonstrated higher score than the male in all domains except mental health, and in the PCS and MCS score, however the differences in these scores were not statistically significant ( $p>0.05$ ).

Accordingly, no significant difference was demonstrated in all of the SF-36 health domains between stroke subjects who had stroke for less than a year and those who had stroke for one year and more ( $p>0.05$ ) (Table 3). However, stroke subjects of one year and more post-stroke demonstrated slightly higher mean score in almost all of the health domains of SF-36, with general health mean score approaching statistical significance ( $p=0.05$ ).

**Table 2 SF-36 Scores Based on Gender**

Domain	Male	Female	p value
	Mean (SD)	Mean (SD)	
Role emotion	49.0 (42.0)	60.4 (39.2)	0.28
Role physical	47.7 (43.6)	56.4 (40.7)	0.44
Bodily pain	77.5 (33.5)	77.5 (26.6)	0.99
Energy	52.5 (21.0)	58.7 (20.1)	0.24
General health	57.2 (16.9)	70.3 (21.0)	0.01*
Social function	52.2 (26.3)	73.1 (27.8)	0.00*
Physical function	56.9 (29.0)	64.0 (28.0)	0.33
Mental health	67.1 (18.3)	66.6 (20.0)	0.91
PCS	42.6 (10.6)	45.9 (9.2)	0.21
MCS	42.9 (11.0)	46.4 (10.6)	0.22

\*Significant at p < 0.05

**Table 3 SF-36 Scores Based on Post-stroke Duration**

Domain	Post-stroke duration		p value
	< 1 year	≥ 1 year	
	Mean (SD)	Mean (SD)	
Role emotion	45.4 (40.6)	59.0 (40.8)	0.22
Role physical	46.6 (45.8)	54.5 (40.5)	0.49
Bodily pain	78.1 (32.2)	77.3 (29.8)	0.92
Energy	55.2 (19.5)	55.3 (21.7)	0.99
General health	56.4 (19.5)	66.7 (19.3)	0.05
Social function	64.2 (25.7)	59.9 (30.6)	0.58
Physical function	57.5 (32.4)	61.5 (26.5)	0.60
Mental health	64.4 (21.3)	68.4 (17.7)	0.43
PCS	43.1 (12.2)	44.6 (8.9)	0.59
MCS	43.5 (11.4)	45.1 (10.8)	0.58

**DISCUSSION**

The findings of this study showed that the SF-36 scores of stroke subjects are lower than that of general Malaysian population, in all domains, with the exception of bodily pain. This result is in congruent with the findings of several previous studies<sup>6,8,9,10</sup> that reported a low mean score in stroke patients' SF-36 in almost all domains. The scores were lowest for role physical (51.6), followed by physical functioning (60.0), suggesting that stroke patients in this study still encounter difficulties with their physical activities such as carrying groceries, running and lifting heavy objects as assessed in this tool. The finding of a low physical functioning and role physical has been reported

in several previous studies<sup>6,11,18</sup> of HRQoL in stroke survivors using the SF-36.

Hackett et al.<sup>6</sup>, in 2000, found that long-term stroke survivors in New Zealand, when compared to a general population, had significantly lower SF-36 scores in role physical, physical functioning, general health and role emotional. Mayo et al.<sup>18</sup>, in their study of community-dwelling stroke survivors in Quebec, noted a mean physical function score of 63.4 in the stroke group at six months post-stroke, while that of general population was 85.0. In another study in 2006, Kong and Yang<sup>11</sup> also reported a low physical functioning mean score of 23.9 in 100 chronic stroke survivors attending a rehabilitation service in Singapore. Post-stroke sequels, which are commonly complicated and related to sensory-motor, cognitive,

psychological and behavioural impairment may directly affect physical ability of the stroke patients<sup>7</sup>.

Stroke subjects in this study also had lower role emotion (54.09) than that of the normal population (79.2). This is not surprising, given the high prevalence and adverse effects of emotional disorders among patients with stroke, particularly within the first year after onset. A study by Dennis et al.<sup>19</sup> in Edinburgh found that out of 372 chronic stroke patients, 60% had some form of emotional distress, 22% had anxiety and 20% had depression when emotional problems were measured using the general health questionnaire (GHQ) 30 item, and hospital anxiety and depression scale (HAD). Severe strokes resulting in physical disabilities and expressive communication problems are among the predictors of emotional distress in chronic stroke patients<sup>20</sup>.

With the exception of mental health, male stroke survivors scored lower than their female counterparts in all health domains, and in PCS and MCS of SF-36. The differences in SF-36 score between the male and female were statistically significant in general health (57.2 vs 70.3,  $p=0.01$ ) and social functioning (52.2 vs 73.1,  $p=0.00$ ). This finding does not support the result of previous studies by Xie et al.<sup>8</sup> and Halvor et al.<sup>9</sup> in 2006 and Hackett et al.<sup>6</sup>, in 2000 which reported lower HRQoL among the female stroke survivors than the male. A possible explanation could be proposed for this difference. In the previous studies, female stroke survivors had a significant post-stroke depression and anxiety. It has been established that depression and anxiety are contributors to low quality of life<sup>2,3,4,21</sup> and that depressed patients appeared to have a more impaired physical activities than non-depressed patients<sup>21</sup>. However, depression was not reported among stroke survivors in this study, possibly due to positive effects of living with families. Family members are important sources of psychological support<sup>22</sup>, and stroke patients who lived with families have been found to have better mental health than those who lived alone<sup>23</sup>.

No significant differences were noted in scores of all health domains between stroke subjects who had stroke less than a year and stroke subjects of more than a year post-stroke. However, the more chronic stroke subjects demonstrated higher mean scores in almost all SF-36 health domains particularly in general health ( $p=0.05$ ). Improvement in HRQoL as the stroke duration increases has been reported in several previous studies. Jonkman et al.<sup>24</sup>, in their study of 35 stroke subjects in Netherland found that in a homogenous group of stroke patients, HRQoL somewhat improved overtime,

although the scores were still highly abnormal after 1 year. In another study, Patel et al.<sup>25</sup> reported that at 3 years post-stroke, despite having moderate or severe disability, SF-36 scores of stroke survivors in England were satisfactory, especially for the mental component. In Singapore, Kong and Yang<sup>11</sup> found that at 1 year 10 months post-stroke, stroke patients demonstrated a HRQoL comparable to that of the normal population, with the exception of physical function. A longer post-stroke duration allows more time for patients to cope with their disabilities, and this is likely to have a positive effect on their HRQoL<sup>11</sup>.

This study is subjected to several limitations. The main limitation is the pre-selected nature of the study cohort as only patients who received rehabilitation were surveyed. Thus, patients with mild or very severe strokes were not likely to have been included and the study cohort was therefore not representative of the general stroke population in Malaysia. Also, this study could not evaluate the differences of stroke survivors' HRQoL based on other demographic characteristics such as ethnicity, as a huge percentage of the subjects were Chinese patients and none were Indian patients, thus a more detail information on stroke survivors in Malaysia was not obtained. A more careful selection of stroke patients, using stratified random sampling would have enabled comparison between subgroups of selected demographic features. In addition, the use of a more specific HRQoL scale in stroke subjects as opposed to a generic scale like SF-36 would provide a more accurate assessment of post-stroke HRQoL. However, as this study aimed to compare HRQoL of stroke patients with that of normal Malaysian population, using a stroke-specific HRQoL tool was not possible. Despite these limitations, the results of this study indicate that the majority of patients had low health domains scores particularly for physical functioning and physical role.

## CONCLUSION

**Stroke** survivors had significantly lower HRQoL than general Malaysian population, as measured using SF-36, with the exception of bodily pain. Male stroke survivors have lower HRQoL score than females in all domains, in particular general health and social functioning. On the positive side, stroke survivors in this study did not experience any more pain than the general population. However, further studies using more specific HRQoL scales are required to assess health domains of Malaysian stroke survivors in a comprehensive manner. Future studies should

also include an objective assessment of functional outcomes to enable evaluation of relationship between HRQoL and functional abilities of stroke survivors.

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