

# A Survey Based Study of Quality of Life in Stroke Patients Ambulating with Walker

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## Author's Contribution

<sup>1</sup>Conception and design, Collection and assembly of data, <sup>2</sup>Analysis and interpretation of the data, <sup>3</sup>Critical revision of the article for important intellectual content, <sup>1</sup>Statistical expertise <sup>1</sup>Final approval and guarantor of the article

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## A B S T R A C T

**Background:** The ability to walk independently from place to place with or without a walking aid is called ambulation. Uncontrollable and abnormal walking patterns are called walking abnormalities. Walking abilities along general health of patients may be affected following cerebrovascular diseases.

**Objectives:** This study is targeted to determine the health related quality of life in stroke patients (male and female categorized) ambulating with walker.

**Methodology:** This research is a cross-sectional survey for total number of 78 patients with Cerebro Vascular Disease (CVD) having lower limb disability and stroke event between six and twelve months, having ages between 35-55 years. Survey was performed from August 2019 to November 2019. Data analysis has been performed using computer software IBM SPSS 24. The study was performed at Aziz Bhatti Shaheed (DHQ) teaching hospital and Dr. Ejaz Physiotherapy services, Gujrat, Pakistan. Total four months is time lapsed during the study and survey was taken through SF-36 questionnaire.

**Results:** For Mental Health (MH), results show positively skewed distribution, which shows that 60% of the stroke patients tend to have score towards zero. Results of bodily pain mean score was  $61.4 \pm 15.1$ , and the minimum and maximum scores were 22 and 90 respectively.

**Conclusion:** This study was intended to determine the health related quality of life in stroke patients ambulating with walker. Moderate to severe activities have much interference on general health, physical and social functioning of the patients.

**Key Words:** Cerebrovascular Disease, Health Related Quality of Life, Transient Ischemic Attack, World Health Organization.

## Introduction

Ambulation is the process to walk without independently and genetic defects, diseases or injuries and other factors that may cause walking abnormalities. These abnormalities can affect nerves, bones or muscles of the legs. <sup>1</sup>

The process of human walking is accomplished through process of double pendulum mechanism. Leg leaving the ground surface in moving forward is swing ahead from the hip and called first pendulum. During the second step named inverted pendulum, leg forays with ground through heel and it is rolled up to the toe. The coordination of both legs keeps any one of the foot contacted with ground at any instant. <sup>2</sup>

The main difference between walk and gait is that during walking, one leg is in swing and other is at ground. During running, ballistic phase occurs in which both feet of the runner are in the air.<sup>3</sup> Walking cycle comprises 60% of stance phase, when both feet are on the ground. Whereas in running, the duration of stance cycle is lesser. In the gait, there is a float cycle, the time during which when both feet are off from the ground.<sup>4</sup>

Swing is defined as the phase during which one foot is in the air, while other one is on ground. In the gait phase, foot which is in the air is called in swing. There are five sub-stages

of stance phase (foot on the ground) of walking that a single foot undergoes.<sup>5</sup>

The entire leg may be affected or abnormalities can be present in different parts of the leg such as hip, knee or ankle. Walking abnormalities may also be due to foot problems. These abnormalities, depending upon their cause, may be temporary or long term. The latter one can require continuous medical care and physiotherapy.<sup>6</sup>

Some conditions like stroke, cerebral palsy or carcinoma etc. can cause walking abnormalities permanently.<sup>7</sup> The patients with permanent walking abnormalities may require assistive devices such as a cane, a walker, leg braces or crutches. These walking aids, according to the need of individual, help to maintain upright ambulation, improved stability, reduced loading of lower limb and generate movement.<sup>8</sup>

Stroke is actually a medical disorder which is caused by less blood flow towards the human brain, also called cerebrovascular accident (CVA). Stroke is mainly categorized as ischemic and hemorrhagic, both causing various parts of brain not to function appropriately. First is caused by deficiency in blood flow, while later is caused due to bleeding.<sup>9</sup> There are a lot of indications and symptoms of stroke including unable to move one part of the body or feel the motion, dizziness, issues in speaking, or loss of vision on one side. Symptoms are faced right after the patient is affected by stroke. Lasting of the symptoms for less than one or two hours is known as Transient Ischemic Attack (TIA) or mini-stroke. A hemorrhagic stroke may also be linked with a severe headache.<sup>10</sup>

A person's autonomous movement in home or society is restricted as limited walking ability followed by the stroke. Patient becomes social handicap and reduces walking activity. This decrease in walking/ movement may be due to reduction in all traits of walking or only in specified parts. In order to develop mechanism for maximizing effectiveness in activities right after the stroke, it is necessary to understand particular walking activity discrepancies.<sup>11</sup>

A walker or walking frame is a device for people with disability who need additional support during walking to maintain stability and balance.<sup>12</sup> According to a study, above 1.5 million people in the United States need walkers for walking. Research has revealed that 30 - 50% patients do not use ambulation aid right after its delivery. This data stresses on proper aiding tool requirement, size and fitting, and to educate and train the patient about its proper usage.<sup>13</sup>

It is the most stable assistive device which consists of a metal framework with three or more contact points which are

placed in front of the user and he grips the freestanding metal frame during movement. The contact points of walker may have fixed rubber ferrules or wheels or combination of both. Walkers with wheels are known as rollators.<sup>14</sup>

As per definition of quality of life by World Health Organization (WHO), it is the measure of one's sensitivity towards position in life in social and cultural context. It is a multi-dimensional concept which may be affected person's physical health, psychological condition, independence level, social interactions and believes<sup>15,16</sup>. People with disability have to face a lot of barriers in their life because of constraint of involvement. They may experience poor health, less or no education, deficiency of economic and social contribution, scarceness and dependence on others.<sup>17</sup>

To determine the health related quality of life in the stroke patients who ambulate with walker. The rationale of the study is to correlate the health related quality of life in stroke patients having lower limb disabilities ambulating with walker.

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## Methodology

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The present study is a cross sectional study and was conducted at Aziz Bhatti Shaheed (DHQ) Teaching Hospital, Bhimber Road Gujrat, and Dr. Ejaz Physiotherapy services, Gujrat, Pakistan from August 2019 to November 2019.

Study Population includes male and female stroke patients with lower limb disability ambulating with walker as walking aid. Total number of 78 patients were enrolled in the study and the sample size was calculated by the cited reference<sup>18</sup> keeping population variance 20.25, the margin of error equal to 1% and level of significance equal to 5%.

**Inclusion Criteria:** Patients with Cerebrovascular disease (CVD) having lower limb disability and use walker as a walking aid. Patients aged in the range 35-55 years. Stroke event between 06 and 12 months. **Exclusion Criteria:** Patients with complaint of uncontrolled seizures. Patients unable to respond the commands. Patients with no other associated neurological illness or other degenerative disease.

**Data Collection and Analysis:** For data collection, a written informed consent was obtained from the patients to participate in the study. They were assessed for QOL through SF-36 questionnaire. Section "general health" of the SF-36 survey form helps measure status of health and being used commonly for health related economic factors as a mutable in the quality adjusted life year calculations. This may result in finding cost effectiveness of a healthy treatment. "SF-36 Score" has been increasingly reported in the scientific literature and has proved validity and reliability.<sup>19, 20</sup> Collected data was entered and analyzed using IBM SPSS 24. For the descriptive

analysis, parameters selected for study are mean, standard deviation, frequency, percentages, charts and graphs. For inferential statistics t-test has been used, considering p-value less than 0.05 statistically significant.

## Results

The first domain is physical functioning composed of 10 items; 3a, 3b, 3c up to 3j. The mean score of physical functioning of patients with stroke was  $60.0 \pm 26.8$ . The physical functioning scores were transformed and calculated out of 100. The mean score is although more than 50 but it is not as valid as it is far from 100. Whereas minimum score for physical functioning was 25 and maximum score was 95.

The second domain of health related quality of life is role physical consists of 4 items; 4a, 4b, 4c and 4d. The mean score was  $49.7 \pm 32.4$ . The minimum score for role physical was 0 and maximum score was 100.

Third domain of health related quality of life in stroke patients is bodily pain consisting of 2 items; 7 and 8. The mean score was  $61.4 \pm 15.1$ . The minimum score for bodily pain was 22 and maximum score was 90. Fourth domain is general health, which consists of 5 items; 1, 11a, 11b, 11c and 11d. The mean score was  $60.7 \pm 13.8$ . The minimum score was 20 and maximum score was 95. The fifth domain of the HRQOL is vitality consisting of four items; 9a, 9e, 9g and 9i. The mean score for vitality was  $46.4 \pm 15.1$ . The minimum score was 20 and maximum score was 80.

Social functioning is the sixth domain of HRQOL consisting of 2 items; 6 and 10. The mean score was  $58.7 \pm 14.3$ . The minimum score for social functioning was 25 and maximum score was 87.

The next domain is role emotional that consists of 3 items values 5a, 5b and 5c. The mean score was  $49.1 \pm 38.6$ . The minimum score was 0 and maximum score was 100.

The last domain is mental health, which consists of 5 items values 9b, 9c, 9d, 9f and 9h. The mean score was  $40.4 \pm 13.2$ . The minimum score was 24 and maximum score was 84. A demographic profile of patients with data is given in table I. The gender wise comparison of HRQOL in stroke patients ambulating with walker is given in table II.

Results show that gender has no significant effect on post-stroke ambulation. It is also indicated in the graph below as blue line (for females) is overlapping the green line (males).

As a response to general health status, 60% people from sample reported that their health is good. The first domain is physical functioning like vigorous and moderate daily

activities including climbing, walking, bathing and dressing. The mean score of physical functioning of patients with stroke was  $60.0 \pm 26.8$ , as shown in figure 1. The physical functioning scores were transformed and calculated out of 100. The mean score is although more than 50 but it is not as valid as it is far from 100. Whereas minimum score for physical functioning was 25 and maximum score was 95.

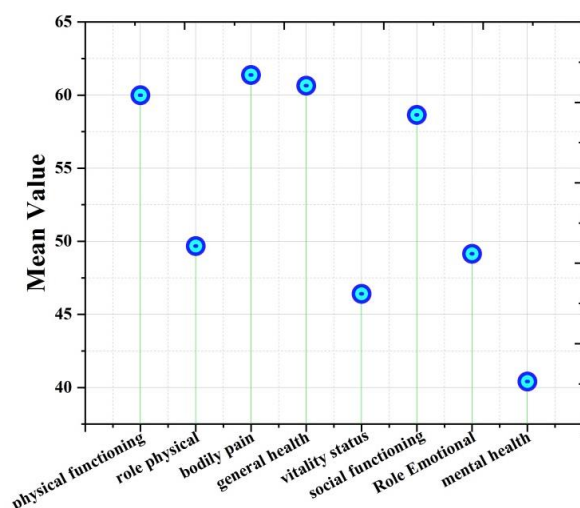
**Table I: HRQOL in stroke patients ambulating with walker**

Domains	N	Mean $\pm$ SD		Min.	Max.
<b>Physical Functioning</b>	10	60.0	26.8	25	95
<b>Role Physical</b>	4	49.7	32.4	0	100
<b>Bodily Pain</b>	2	61.4	15.1	22	90
<b>General Health</b>	5	60.7	13.8	20	95
<b>Vitality</b>	4	46.4	15.1	20	80
<b>Social Functioning</b>	2	58.7	14.3	25	87
<b>Role Emotional</b>	3	49.1	38.6	0	100
<b>Mental Health</b>	5	40.4	13.2	24	84

**Table II: Gender wise comparison of HRQOL**

Domains	Gender	N	Mean $\pm$ SD	t	P-value
<b>Physical Functioning</b>	Male	36	60.8 $\pm$ 27.5	-0.25	0.801
	Female	42	59.3 $\pm$ 26.4		
<b>Role Physical</b>	Male	36	55.6 $\pm$ 30.0	-1.50	0.14
	Female	42	44.6 $\pm$ 33.8		
<b>Bodily Pain</b>	Male	36	60.5 $\pm$ 16.6	-	0.64
	Female	42	62.1 $\pm$ 13.9		
<b>General Health</b>	Male	36	61.4 $\pm$ 16.0	-0.42	0.68
	Female	42	60.0 $\pm$ 11.8		
<b>Vitality</b>	Male	36	45.7 $\pm$ 15.9	-	0.70
	Female	42	47.0 $\pm$ 14.6		
<b>Social Functioning</b>	Male	36	59.0 $\pm$ 13.2	-0.21	0.83
	Female	42	58.3 $\pm$ 15.3		
<b>Role Emotional</b>	Male	36	52.8 $\pm$ 39.3	-0.77	0.45
	Female	42	46.0 $\pm$ 38.2		
<b>Mental Health</b>	Male	36	39.7 $\pm$ 12.6	-	0.65
	Female	42	41.0 $\pm$ 13.8		

The second domain of health related quality of life is role physical consists four items i.e. amount of time spent on work, accomplishment of less work than before, problems limit the kind of work, difficulty in performing work. The mean score was  $49.7 \pm 32.4$ . The minimum score for role physical was zero and maximum score was 100.



**Figure. 2: Histogram of all parameters and their mean values**

Third domain of health related quality of life in stroke patients is bodily pain consisting of two questions, which are, patients had how much bodily pain and its interference with normal work routine. The mean score was  $61.4 \pm 15.1$ , and the minimum score for bodily pain was 22 and maximum score was 90.

Fourth domain is general health, which consists of five questions regarding general health condition. The mean score was  $60.7 \pm 13.8$ , and the minimum score was 20 and maximum score was 95. The fifth domain of the HRQOL was about the state of patients being energetic (V). The mean score for vitality was  $46.4 \pm 15.1$ , and the minimum score was 20 and maximum score was 80.

Social functioning is the sixth domain of HRQOL. The mean score was  $58.7 \pm 14.3$ , and the minimum score for social functioning was 25 and maximum score was 87. The next domain is role emotional determined from three questions. The mean score was  $49.1 \pm 38.6$ . The minimum score was zero and maximum score was 100. The last domain is mental health having five questions. The mean score was  $40.4 \pm 13.2$ . The minimum score was 24 and maximum score was 84. Results reported in this study are in coordination with as per reported in literature and are validated through previous studies.

Authors have faced issues regarding time constraints and sample size was limited. It is recommended for future studies to address issues relating to time and sample sizing.

## Discussion

Current study reveals that moderate to severe events may have a lot of nosiness on general health as well physical

and social functioning of the patients. Results presented in the study are validated by the literature. As per literature, with increased level of physical disability in stroke patients, quality of life is decreased. With increased affirmation towards disability and coping level leads towards higher quality of life.<sup>21</sup> A social and emotional based recognition of disability and coping strategy will be required after rehabilitation process.<sup>22</sup> Followed by severe stroke, evaluation of HRQOL should be done after at least three months because outcomes of treatment may be significantly observed between three months and one year.<sup>23</sup>

Authors have faced issues regarding time constraints and sample size was limited. It is recommended for future studies to address issues relating to time and sample sizing.

## Conclusion

This study was intended to determine the health related quality of life in stroke patients ambulating with walker. As a response to general health status, more than 50 people from sample say that their health is good. The results of role physical functions show that the mean score was  $49.7 \pm 32.4$  and minimum score for role physical was zero and maximum score was 100. The factors bodily pain (BP), general health (GH), vitality (V), social functioning (SF) do not have skewness in the curve and are normally distributed. Normally distributed means that it has no significant change in these domains. The values of Role Emotional (RE) has equal distribution of patients in each quartile and the mean score was  $49.1 \pm 38.6$ . For Mental Health (MH), results show positively skewed distribution, which shows that majority of the stroke patients tend to have score towards zero. The mean score was  $40.4 \pm 13.2$ , minimum score was 24 and maximum score was 84. This indicates that MH of patients would be impaired after stroke.

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