Oral health related quality of life in stroke survivors at community-based rehabilitation centre: A pilot study

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Oral health related quality of life in stroke survivors at community-based rehabilitation centre: A pilot study

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Abstract

Background: Despite being a common problem, long-term disability following stroke often improves after survivors receive regular rehabilitative therapy. This study aimed to assess the oral health-related quality of life (OHRQoL) of stroke survivors who had access to a community-based rehabilitation centre after hospital discharge. Methods: Dentate post-stroke patients receiving regular rehabilitative care with slight to moderate dependency (Barthel Index >70) and without severe cognitive impairment were involved in this study. The OHRQoL parameters were measured using the Oral Health Impact Profile-14 (OHIP-14) and EuroQol five dimensions (EQ-5D-5L) questionnaires. Results: Thirty one patients were recruited in this study. Majority of the patients hardly ever or never had problems in all functional, physical, psychological and social domains, including eating discomfort and having to avoid eating, difficulty in chewing food and presumably having bad breath (58.1%, 61.3% and 71.0% respectively). Other than gender, age, ethnicity, comorbidities and oral hygiene practices, education level was the only variable found to significantly affect patients’ OHRQoL (p = 0.028). Most of the patients had no or slight problem(s) in self-care (87.1%) and carrying out usual activities (57.1%), pain/discomfort (3.2%) and anxiety/depression (6.5%). Conclusion: Stroke survivors under regular rehabilitative care perceived have good oral health-related quality of life.

Keywords: post-stroke, general health, oral health, quality of life, rehabilitation centre

Introduction

Stroke remains a common global health-care problem with long-term implications for disability. According to the Malaysian Stroke Registry, stroke is among the top five leading causes of death,¹ with a total of 11,284 stroke cases and an increased mortality rate reported between 2009 and 2016. The main contributory death factors of stroke include massive bleeding (34%), massive cerebral infarct (25%), and aspiration pneumonia (22%). Nearly two-thirds of those who manage to survive a stroke will suffer long-term disability alongside physical, psychological, and/or social impairments after discharge from the hospital.² To ensure a better life quality and care following an acute stroke and hospital discharge, it is crucial to provide long-term post-stroke rehabilitative care to patients during their recovery period;³ it is also vital to establish community-based rehabilitative centers throughout Malaysia.⁴ This is especially important in areas where access to stroke care services is limited or lacking.⁵

Oral health-related quality of life (OHR-QoL) refers to the extent to which oral disorders affect a person’s functions and psychosocial well-being.⁶ Stroke can have negative impacts on vital oral functions, such as eating, swallowing, and communication, while medications-associated dry mouth has been shown to cause oral health deterioration in post-stroke patients.⁷ In addition, the disability to eat well can considerably impact nutrition, quality of life, general health, and subsequent recovery.⁸ Home-residing stroke survivors following discharge from the hospital have been shown to have poor OHR-QoL due to physical disability and poor oral health.⁹
hygiene. Long-term adverse effects of OHR-QoL have been well documented for six months and even one year after discharge from the hospital.

Stroke survivors who receive outpatient rehabilitation immediately after they are medically stable have exhibited favorable stroke recovery. The multi-disciplinary approach in community-based rehabilitation centers can help stroke survivors control their blood pressure and improve their functional level. Furthermore, the introduction of advanced oral healthcare programs in outpatient rehabilitation centers has been proven to improve oral hygiene and OHR-QoL of stroke survivors. A study on post-discharge stroke survivors in one of the primary care units in Malaysia showed the positive impacts of OHR-QoL, especially in the domains of functional limitations, physical disability, and handicap.

With the growing number of post-stroke survivors in Malaysia, the quality of life of this population deserves more attention. Although many studies to date have been conducted on OHR-QoL in post-stroke patients, their focus has mainly been on hospitalized stroke patients, overlooking the majority of post-stroke patients who have been transferred to primary care centers after discharge from the hospital. Hence, this study aims to draw on the European Quality of Life Five Dimensions Five Level Scale questionnaire (EQ-5D-5L) and the oral health impact profile-14 (OHIP-14) to assess OHR-QoL in post-stroke patients who are receiving long-term rehabilitative care.

Methods

This cross-sectional study involved stroke survivors who received rehabilitative care in a government primary care clinic in Kuala Lumpur from June 2017 to December 2017. Inclusion criteria required patients to: (a) have been in a stabilized condition since discharge from an acute care hospital and able to perform their daily activities with slight or moderate dependency (Barthel Index > 70); (b) be 18 years old and above, and; (c) have reported stable cases when transferred to a rehabilitation clinic from an acute care hospital. Patients were excluded if they had a severe cognitive impairment (Mini-Mental State Examination score ≤ 9), had nasogastric tube insertion/placement, or were edentulous. Written informed consent was obtained from all patients at recruitment. Patient information, such as, age, gender, ethnicity and level of education was recorded. This study was approved by the Institutional Review Board of the National University of Malaysia (Ethics No.: UKM PPI/111/8/JEP-2016-525).

Questionnaires. The quality-of-life parameters were measured using the following translated and validated questionnaires EQ-5D-5L and OHIP-14. All patients were able to read and understand Malay and/or English; they completed the above two questionnaires themselves in the presence of an interviewer.

Measurement of generic health status. EQ-5D-5L is an instrument that measures the general health status along five dimensions, namely mobility, self-care, routine activities, pain/discomfort, and anxiety/depression. The respondents self-rated their level of severity for each dimension using a five-level scale: “having no problems;” “having minor problems;” “having moderate problems;” “having severe problems;” and “having extreme problems.”

Measurement of oral specific quality of life. OHIP-14 is a 14-item instrument that captures the seven dimensions of oral health components, namely handicap, social disability, psychological disability, physical disability, psychological discomfort, physical pain, and functional limitation. Responses are coded using a 5-point Likert scale: 0 = never; 1 = hardly ever; 2 = occasionally; 3 = fairly often; and 4 = very often. A high score indicates poor OHR-QoL, while the total number of patients choosing “never” and “hardly ever” represents the percentage of patients with satisfactory OHR-QoL.

Statistical analyses. All the collected data were analyzed using SPSS software version 22 (SPSS Inc.). Frequencies and percentages were used to describe the distribution of responses for each question in EQ-5D-5L and OHIP-14 questionnaires. Because the sample size was small and the data were not normally distributed, the Mann–Whitney and Kruskal–Wallis tests were used to assess the median OHIP-14 scores based on sociodemographic characteristics, general health factors, and oral hygiene practices. The level of significance was set at 0.05 for all tests.

Results

The sociodemographic characteristics of stroke survivors and their association with the median OHIP scores are shown in Table 1. Our study involved 22 male (71%) and nine female patients, representing 36.9% of the total clinic enrolment with a mean age of 62 years (SD = 10.01). No significant differences were found between gender, age, ethnicity, and the median OHIP scores. However, patients with higher levels of education showed significantly poor OHR-QoL (p = 0.028).

Tables 2 and 3 demonstrate the median OHIP scores based on general health and oral hygiene practices. The majority of patients in this study were diagnosed with hypertension, hypercholesterolemia, and/or diabetes; however, the presence of these comorbidities did not significantly affect OHR-QoL. Most of the patients visited dental clinics when needed (67.7%), brushed their
Table 1. OHIP-14 scores according to the sociodemography characteristics of stroke survivors

| Variables               | N (%) | Median OHIP scores | 95% CI      | p*     |
|-------------------------|-------|--------------------|-------------|--------|
| Gender                  |       |                    |             |        |
| Male                    | 22 (71.0) | 22.5      | 18.0–29.0   | 0.250  |
| Female                  | 9 (29.0)   | 19.0      | 16.0–28.0   |        |
| Age (years)             |       |                    |             |        |
| 30–49                   | 3 (9.6)    | 20.0      | 14.0–33.0   | 0.471  |
| 50–69                   | 22 (71.0)  | 23.0      | 19.0–29.0   |        |
| 70–89                   | 6 (19.4)    | 18.0      | 15.5–25.0   |        |
| Ethnicity               |       |                    |             |        |
| Malay                   | 18 (58.1)  | 24.0      | 19.0–32.0   |        |
| Chinese                 | 11 (35.5)  | 20.0      | 17.0–23.5   | 0.257  |
| Indian                  | 1 (3.2)     | 14.0      | 14.0–14.0   |        |
| Others                  | 1 (3.2)     | 22.0      | 22.0–22.0   |        |
| Educational level       |       |                    |             |        |
| Primary school          | 5 (16.1)   | 18.0      | 17.0–25.0   |        |
| Secondary school        | 22 (71.0)  | 22.0      | 18.0–24.0   | 0.028* |
| University              | 4 (12.9)    | 32.0      | 19.0–67.0   |        |

*p < 0.05
Mann–Whitney test for gender.
Kruskal–Wallis test for age, ethnicity, and education level.

Table 2. OHIP-14 scores based on types of medical conditions

| Comorbidities     | N (%) | Median OHIP scores | 95% CI      | p     |
|-------------------|-------|--------------------|-------------|-------|
| Hypertension      |       |                    |             |       |
| Yes               | 28 (90.3) | 22.0      | 18.0–24.5   | 0.234 |
| No                | 3 (9.7)    | 41.0      | 17.0–67.0   |       |
| Hypercholesterol  |       |                    |             |       |
| Yes               | 17 (54.8)  | 23.0      | 18.0–29.0   | 0.528 |
| No                | 14 (45.2)  | 22.0      | 17.0–33.0   |       |
| Diabetes          |       |                    |             |       |
| Yes               | 16 (51.6)  | 21.0      | 18.0–25.0   | 0.785 |
| No                | 15 (48.4)  | 24.0      | 17.0–31.5   |       |

*p < 0.05
Mann–Whitney test for hypertension, hypercholesterol, and diabetes.

Table 3. OHIP-14 scores according to oral hygiene practices

| Variables                       | N (%) | Median OHIP scores | 95% CI      | p     |
|---------------------------------|-------|--------------------|-------------|-------|
| Frequency of dental visit       |       |                    |             |       |
| <Once a year                    | 7 (22.6) | 23.0      | 17.5–33.0   | 0.935 |
| >Once a year                    | 3 (9.7)    | 19.0      | 18.0–44.0   |       |
| When needed                     | 21 (67.7)  | 22.0      | 18.0–28.0   |       |
| Frequency of tooth brushing     |       |                    |             |       |
| Once a day                      | 16 (51.6)  | 18.0      | 17.0–25.0   | 0.644 |
| Twice a day                     | 11 (35.5)  | 25.5      | 22.0–32.0   |       |
| >Twice a day                    | 4 (12.9)    | 18.5      | 16.0–41.0   |       |
| Frequency of mouth rinsing      |       |                    |             |       |
| Never                           | 28 (90.4)  | 22.0      | 18.0–25.0   | 0.664 |
| Seldom                          | 1 (3.2)     | 35.0      | 35.0–35.0   |       |
| Once a day                      | 1 (3.2)     | 32.0      | 32.0–32.0   |       |
| More than twice a day           | 1 (3.2)     | 18.0      | 18.0–18.0   |       |
| Frequency of flossing           |       |                    |             |       |
| Never                           | 30 (96.8)  | 22.0      | 18.0–25.0   | 0.078 |
| Seldom                          | 1 (3.2)     | 44.0      | 44.0–44.0   |       |

*p < 0.05
Table 4. Percentage distribution of patients according to their responses to individual OHIP-14 questions

| Items                    | Very often/quite often | Sometimes | Seldom/never |
|--------------------------|------------------------|-----------|--------------|
|                          | N (%)                  | N (%)     | N (%)        |
| **Functional limitations** |                        |           |              |
| Chewing difficulty       | 5 (16.1)               | 7 (22.6)  | 19 (61.3)    |
| Bad breath               | 4 (12.9)               | 5 (16.1)  | 22 (71.0)    |
| **Physical pain**        |                        |           |              |
| Eating discomfort        | 4 (12.9)               | 9 (29.0)  | 18 (58.1)    |
| Oral ulcer               | 2 (6.5)                | 3 (9.7)   | 26 (83.9)    |
| **Psychological discomfort** |                      |           |              |
| Food lodged              | 10 (32.3)              | 9 (29.0)  | 12 (38.7)    |
| Shy                      | 1 (3.2)                | 7 (22.6)  | 23 (74.2)    |
| **Physical disability**  |                        |           |              |
| Avoid eating             | 6 (19.4)               | 7 (22.6)  | 18 (58.1)    |
| Avoid smiling            | 0 (0.0)                | 5 (16.1)  | 26 (83.9)    |
| **Psychological disability** |                      |           |              |
| Sleep disturbance        | 3 (9.7)                | 1 (3.2)   | 27 (87.1)    |
| Concentration disturbance| 1 (3.2)                | 2 (6.5)   | 28 (90.3)    |
| **Social disability**    |                        |           |              |
| Avoiding socializing     | 2 (6.5)                | 0 (0.0)   | 29 (93.5)    |
| Daily activities disrupted|                      |           |              |
| Handicap                 | 5 (16.1)               | 4 (12.9)  | 22 (71.0)    |
| Low confidence           | 2 (6.5)                | 2 (9.7)   | 26 (83.9)    |

Table 5. Percentage distribution of patients according to their responses to individual EuroQol questions

| Items                     | No or minor problems N (%) | Moderate problems N (%) | Severe problems N (%) |
|---------------------------|---------------------------|-------------------------|-----------------------|
| Mobility                  | 12 (38.7)                 | 13 (41.9)               | 6 (19.4)              |
| Self-care                 | 27 (87.1)                 | 1 (3.2)                 | 3 (9.7)               |
| Routine activities        | 18 (58.1)                 | 5 (16.1)                | 8 (25.8)              |
| Pain or discomfort        | 21 (67.7)                 | 9 (29.0)                | 1 (3.2)               |
| Anxiety or depression     | 22 (71.0)                 | 7 (22.6)                | 2 (6.5)               |

teeth once a day (51.6%), and never used mouth rinse (90.3%) or flossing (96.8%). None of the oral hygiene practices had a significant impact on OHR-QoL.

The majority of patients seldom or never had problems in any of the domains, notably the “psychological disability” and “social disability” domains (Table 4). More than 75% of the patients felt confident in their life after the stroke. However, fewer than 50% of the patients refrained from eating certain foods because of chewing and eating difficulties. Food impaction (61.3%) was the only individual item response that considerably affected their OHR-QoL.

According to Table 5, 41.9% of the post-stroke patients in our study had moderate problems in mobility. However, this problem barely caused further functional limitations in the majority of patients in terms of self-care (87.1%) and carrying out daily activities (58.1%). More than 50% of the patients had slight or no stroke-related pain and discomfort and had better mental health.

Discussion

Oral health is an integral part of general health and is part of the multidimensional domains that affect the quality of life.20 Thus, not only did the use of both generic measures (EQ-5D-5L) and oral specific measures (OHIP-14) in this study help attain a comprehensive assessment of OHR-QoL among stroke survivors but the simplicity of both questionnaires also helped reduce the burden and time required to administer the outcome measures to all the respondents.21

Our study showed that up to 60% of the patients suffered from moderate-to-severe mobility problems. Similar findings were reported by another study involving 203 stroke survivors in Malaysia, two or more years post-stroke. In this study, up to 30% of the survivors could not perform outdoor walking without aid.22 However, it is likely that the patients in our study were not affected much by functional limitations in their daily activities despite mobility restrictions. Most of these patients were able to carry out simple
tasks, such as self-cleaning, dressing, and even participating in leisure and family activities. Hence, our results support the benefits of outpatient rehabilitation programs for the improvement of vital functions following a stroke.23

Depression and anxiety are strongly associated with quality-of-life impairment in stroke survivors one year after discharge from the hospital.24 However, this study’s findings showed that the majority of patients suffered from fewer mental health issues reported in the psychological domain assessments of EuroQoL and OHIP-14. This is in line with another study that demonstrated an improvement in depression symptoms among 293 stroke survivors who were receiving outpatient rehabilitation treatment in Belgium.25 This might be explained by the fact that patients with access to post-stroke rehabilitation programs enjoy better coping strategies, which are vital to the post-stroke enhancement process and the minimization of depression symptoms.26

This study investigated the OHR-QoL of stroke survivors in relation to their sociodemographic features, presence of comorbidities, and oral hygiene practices. Only the level of education was found to considerably affect OHR-QoL. In contrast to previous studies,27,28 those with higher education levels in this study usually reported a lower level of OHR-QoL. This trend could emanate from the individuals’ expectations when evaluating their OHR-QoL.29 In comparison with those with lower education levels, highly educated patients were found to be more concerned about their stroke-related oral health and less satisfied with their post-stroke lives,30 while patients with lower education levels were more willing to accept post-stroke changes in their lives; these tendencies were illustrated by a low score in OHIP-14, indicating a better OHR-QoL.

In this study, the majority of patients reported fewer problems in their individual item responses to OHIP-14. This could be attributed to the fact that stroke survivors who had undergone rehabilitation treatment and had higher functional levels enjoyed a better oral health status and OHR-QoL.31 Most patients reported high confidence despite restrictions on their participation in social activities. However, only a minority of them complained about eating difficulties, most probably arising from oro-facial muscle weaknesses.32

The main limitation of our study was its small sample size. Our cohort of post-stroke patients had a better functional status, given that most incapacitated patients tend to complain about their difficulties attending clinic sessions. The results of our study, therefore, may not be fully representative of the general stroke population in Malaysia. To enable comparison between subgroups and minimize bias in interpretations of outcomes, future studies are advised to include more patients from other post-stroke rehabilitation centers throughout Malaysia alongside those who are residing at care homes.

Conclusion

The majority of our respondents faced no problems in their daily health care in terms of general and oral health. Both questionnaires recorded low scores for the majority of respondents, implying a low stroke impact in terms of general and oral health. Despite the limitations mentioned above, findings from our study support the provision of community rehabilitation services for stroke survivors in primary care centers in Malaysia.33 Further studies are required to investigate the effectiveness of oral health-care interventions for the continuation of OHR-QoL after a stroke.34

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Conflict of Interest Statement

The authors declare no conflict of interest.

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