

## RESEARCH

# Impaired quality of life and oral function after a stroke. A qualitative study

## Hilde Kjærnet Haugen

Førstelektor  
Tannteknikerutdanningen, Oslomet – storbyuniversitetet

## Trude Myhrer

Førstelektor og studieleder  
Tannteknikerutdanningen, Oslomet – storbyuniversitetet

## Tiril Willumsen

Professor  
Avdeling for pedodonti og atferdsfag, Universitetet i Oslo

Dental health

Quality of life

Qualitative study

Stroke

Welfare

Sykepleien Forskning 2019;14(79355):e-79355  
DOI: 10.4220/Sykepleienf.2019.79355en

## Summary

**Background:** Information on post-stroke oral health in Norway is sparse. Paralysis and impaired motor skills and chewing and swallowing function mean that patients do not notice their inadequate oral hygiene or are unable to take care of their own oral health. Research shows that oral care has been a low priority in the post-stroke acute and rehabilitation stage. Multidisciplinary knowledge on how oral pathology and tooth loss can occur as a result of paralysis and dry mouth appears to be lacking among the health professionals that treat stroke patients in the acute and rehabilitation stage.

**Purpose:** The purpose of this study is to elucidate the general and oral health-related quality of life of stroke survivors. We also sought to investigate how impaired oral function affects their quality of life both socially and functionally.

**Method:** We conducted 16 qualitative personal interviews with older people living at home in Norway (aged 70–85). The informants were selected from respondents in an earlier study (2), who also gave their consent to participate in this follow-up study.

**Results:** Four informants indicated that they consider their own reduced dental status to be a direct consequence of inadequate oral care follow-up (6 months–2 years) following their stroke. As a result of paralysis and impaired chewing and swallowing function, nine informants still need extra time for meals, prefer soft, easily chewed food cut into small pieces, and/or need help to cut the food up. Acceptance of these circumstances is necessary for the informants to enjoy the meal experience. Informants with fixed, functional teeth have the best oral health-related quality of life. Informants with removable dentures are least satisfied with their oral health-related quality of life.

**Conclusion:** Sequelae of a stroke can impact on the chewing and swallowing function, and can cause dry mouth and loss of teeth. The combination of stroke and oral health seems to reduce both general and oral health-related quality of life. Impaired denture function and/or chewing function can leave patients feeling stigmatised in social contexts, and can lead to reduced food intake and further health complications. Dental health professionals should be involved at an early stage of rehabilitation. More interdisciplinary research and work in the systematic follow-up of this patient group is called for.

Every year, 12 000 people suffer a stroke in Norway. Strokes are caused by acute disruption to the blood circulation of the brain. Stroke survivors often experience paralysis of varying degrees and duration (1).

Oral health refers to the condition of the entire oral cavity – teeth, tongue, mucosa and temporomandibular joints. Post-stroke oral health is an underexplored area in Norway. A quantitative survey was conducted to examine the patient group's dental health needs. Self-perceived dental health was mapped in the survey to ascertain whether quality of life and social participation are reduced as a result of paralysis and impaired oral function.

The results showed that only 5 per cent of respondents (15 of 293) received information about the importance of caring for their teeth during the rehabilitation period 0–6 months after their stroke (2).

## ***Dental health in Norway***

In Norway, dental health is mainly privately initiated and funded. In principle, adults are expected to take responsibility for their own dental treatment. The Norwegian National Insurance Act provides for the financial support of children and young people (aged 0–18) and certain population groups with special dental needs (3).

Under the Ministry of Health and Care Services, one of the groups entitled to free dental care is older patients in institutions or receiving home-based nursing care who are either disabled or have long-term health problems (4).

The remit of the Public Dental Service (DOT) in Norway is to provide regular dental health services to priority groups in the population (5). Depending on their finances, all counties offer dental health services for children and young people, while the provision for cognitively impaired and older persons, and disability pensioners varies considerably, according to Norsk Helsenett (6).

An article series in the newspaper Aftenposten (7) reports that public dental funding is a low priority in Norway compared to other Nordic countries. Varying dental status is interpreted as a manifestation of social inequality in the population, as many people on low incomes, pensioners, single parents and students delay going to the dentist for financial reasons.

The survey report 'Inequality in health service utilisation' confirms a clear social gradient in dental service uptake in relation to income and education. Half of those with an unmet need for dental care state that they cannot afford it (8). Many older people are also probably unaware of their rights and therefore do not receive adequate information and follow-up of their dental health, for example during the post-stroke rehabilitation stage.

## ***Post-stroke oral hygiene***

A systematic literature review related to post-stroke oral treatment and follow-up concludes that subsequent health problems may be caused by inadequate oral hygiene. One-sided paralysis (hemiplegia) reduces the chewing function on the affected side, and a diet consisting of pureed food will, over time, cause a general weakening of the masticatory muscles.

Facial paralysis, including of the tongue, means that the patient is unable to remove any food residue around the teeth and in the oral cavity. Poor dental hygiene caused by paralysis and an increased prevalence of bacteria leads to caries and dental connective tissue disease (9).

**«Facial paralysis, including of the tongue, means that the patient is unable to remove any food residue around the teeth and in the oral cavity.»**

Multidisciplinary knowledge on how oral pathology and tooth loss can occur as a result of paralysis and dry mouth appears to be sparse among the health professionals that treat stroke patients in the acute and rehabilitation stage. Nevertheless, the combination of stroke, impaired physical and cognitive function, low dental status and removable dentures is believed to increase the risk of reduced quality of life.

### ***Purpose of the study***

The purpose of this study was to elucidate the general and oral health-related quality of life of older stroke patients. Through qualitative interviews, we sought to answer the following research question: How do older patients undergoing stroke rehabilitation perceive their quality of life – and how does their impaired oral function affect their eating situation in social contexts?

## **Method**

### ***Sample***

This study has a qualitative approach and was conducted to supplement the results of a post-stroke survey on self-perceived dental health (10) (2). The informants were strategically selected from 293 respondents (aged 70–85) from the Norwegian Association for Stroke Survivors who participated in the survey.

We conducted 16 personal interviews (five women and eleven men) in the informants' own homes in three selected regions. The interviews lasted 30–60 minutes and audio recordings were made. Those who had reported tooth loss and/or denture use in the survey, as well as informants in geographical proximity to each other met the inclusion criteria. All had given written consent for a follow-up interview. Exclusion criteria were large distances to other informants or few informants in the vicinity.

The study was approved by the Regional Committees for Medical and Health Research Ethics (REC South East, reference number 210/2992-1).

### ***Interview guide***

A semi-structured interview guide with open-ended questions was designed to elaborate on themes from the survey. The themes were general quality of life, oral health-related quality of life, dental status, dry mouth (xerostomia), food consistency, use of time and confidence in the eating situation.

In order to address the phenomenological-hermeneutic aspect of allowing informants to freely describe their experiences and perceptions, we rephrased questions, for example as follows: How would you describe a good day? What puts you in a low mood? How would you describe an enjoyable and tasty meal? Under what conditions do you enjoy eating with others? What are you most/least satisfied with about your teeth/dentures?

### ***Interviews***

Two interviewers (the first and second authors) conducted the interviews and made audio recordings (30–60 minutes), which were subsequently transcribed. The interview analysis is based on the ad hoc generation of opinions. According to Kvale, this entails using different approaches and free interaction between different meaning-generation techniques (11).

The 98-page text was condensed into meaningful units and organised in tabular form according to the following question categories: current situation, quality of life, oral function and social participation, and dental health/dental status.

Furthermore, the two interviewers interpreted the material with a view to quantifying similarities and differences and to identifying surprising or unexpected phenomena and individual narratives. Using more than one researcher to interpret the material went some way to reducing arbitrary or partial subjectivity (11).

### ***Ethical and methodology considerations***

The personal interview approach differs from that of sending out and receiving questionnaires. The vulnerability of an interview situation involving difficult life situations and personal feelings represents a challenge to the interviewer; finding the right balance between proximity and distance is difficult because the interviewer may feel affected by the fortunes of the informants (10).

According to Kvale and Brinkmann, the interview situation is not an equal interaction between two people, but is invariably characterised by an asymmetric relationship of power riddled with ethical questions (12). In transcribing the audio files, it was difficult at times to balance the consideration to relevance and dissemination needs with what should be omitted for reasons of integrity.

In the interpretation process, the intention was to distinguish between terms that informants used about specific conditions (experience near) and narratives in which the interviewers included their own interpretation of the event (experience distant) (10). In this context, it must also be mentioned that both interviewers are professionally trained dental technicians.

## Results

The following is a condensed summary of the findings and the analysis from the 16 transcribed interviews. Paralysis resulting from stroke was reported by 13 of the informants. Many have improved function through exercise, but nine still have varying degrees of paralysis and permanent functional impairment. Impaired speech, eating and/or swallowing is mentioned by six informants in particular.

In terms of quality of life and the informants' description of a good day, normal everyday activity was generally considered to be essential. It is important to be able to get out of bed and go for a walk when the weather is nice, as well as to do some form of physical exercise and socialise.

Many informants take pleasure and satisfaction from having their family, and particularly in relation to their children and grandchildren enjoying good health and being a successful part of society. Being independent is a particular source of satisfaction for the informants. Most enjoy activities such as work, courses, exercise, trips and socialising with others, and some are glad of their spouse's presence and assistance.

About half of the informants reported that reduced physical capacity and self-reliance are the source of sadness or feeling down about their own life situation. This also applied to the fear of further loss of independence and growing dependence on others, for example, no longer being able to drive or go for a walk:

'Not being able to help with everyday things, and having to watch my wife take care of everything. Not being able to help is depressing and it makes me feel guilty.'

Bad news about the world situation or illness among family and friends also cause low moods.

### ***Measures to improve oral function***

In terms of oral function related to preferred diet, degree of self-reliance, time use and social participation, where informants are asked to describe an enjoyable and tasty meal, many reported that food consistency is important. The food must be easy to chew and swallow, cut into small pieces and preferably have a soft texture:

'When I was wearing dentures, I dreaded seeing things like solid meat coming to the table because I knew it would cause problems straight away. Eating with others was quite an ordeal!'

**«Many need help to eat the meal as they are unable to use a knife and fork.»**

As many as nine of the informants expressed that they need extra time to eat their meals following the stroke. Some only have the use of one arm as a result of paralysis, while the chewing and swallowing function is impaired in others. Many need help to eat the meal as they are unable to use a knife and fork.

All respondents enjoy eating with others, but preferably with people they know, such as family and friends, who are familiar with their situation. Some say that they enjoy the meal experience under certain conditions, such as when they have more time, when it is accepted that they might make a bit of a mess during the meal, when they are given soft food and when someone cuts their food up.

### ***Dental health and dental status***

With regard to dental health and dental status, all informants reported brushing their teeth themselves without any problems. In relation to noticeable oral changes over the past year, many still experience dry mouth, and some still find it difficult to swallow. With one exception, all respondents visit a dentist or dental hygienist once or twice a year for check-ups and treatment.

Half of the respondents have received recommendations from a dentist or dental hygienist regarding oral hygiene and have had dental work since their stroke. Half confirm having lost one to twelve teeth as an adult. Several have chosen not to replace the missing teeth. Most of those who have replaced lost teeth with permanently cemented bridges and/or removable dentures reported problems stemming from badly fitting or poorly functioning dental replacement.

### ***Inadequate oral follow-up***

With regard to post-stroke oral follow-up, several informants specifically stated that they consider reduced dental status, such as loss of several vital teeth and/or reduced denture function, as a direct consequence of inadequate oral follow-up (6 months–2 years) after the stroke.

They describe poor denture function such as badly fitting dentures (facial misalignment, changes to the alveolar bone) and reduced denture retention (ability to wear the denture) due to oral paralysis. Denture designs that retain food residue are viewed in a negative light, especially in social contexts.

One informant suffered gingivitis (periodontitis) and lost several teeth during the rehabilitation stage, where there was no focus on dental care. She first received publicly funded dental treatment when she returned home after six months, and eventually received a removable partial denture.

Another informant did not visit the dentist for the first two years after his stroke. He was then informed at a meeting for stroke survivors how important it is to visit the dentist regularly. By then it was already too late. He had lost numerous teeth, and was given a full denture in the upper jaw, which did not sit properly due to facial paralysis.

### ***Self-perceived dental status***

In relation to self-perceived dental status and informants' satisfaction with their own teeth or dentures, some informants reported that they are glad they have functional teeth to chew their food with, and some are particularly happy to have properly fixed teeth.

The informants who are most satisfied are those who have replaced their removable dentures with an implant bridge, which was reported to be 'heavenly' by one informant because it meant he could eat normally again. Several also indicated that they consider their teeth to be an important part of their appearance.

The informants with removable dentures were least satisfied with their teeth. The reasons given were: the denture is a poor fit, meaning that it becomes loose or rubs against their gums, or retains food residue, especially where braces are used to attach the denture to the remaining teeth:

'If I'm going out, like to a Christmas dinner, I need to take my toothbrush with me because I have to leave the table when I've finished eating to go and brush my teeth. I take them out and brush them because the food is likely to get stuck in the brace. When I'm off to a party, I have to bring my toothbrush in my bag.'

In terms of the impact of the teeth on daily tasks, the informants who reported self-perceived, normal oral function indicated that they do not think about their teeth as long as they do not have dental pain. Informants who use dentures they are not satisfied with are more aware of their reduced chewing function. One informant who already had dentures before the stroke, said the following:

'Yes, because after the stroke, you know, the dentures didn't fit. They were sticking out here and there, and that sort of thing. All my teeth were taken out a while after the stroke. It took a few years to get used to it, but now I can eat anything.'

Informants who have received treatment for periodontitis are particularly concerned about oral hygiene: 'No, I don't think about my teeth but about the things that get stuck between my teeth. In the gaps. The thought of being toothless is awful!'



## **Discussion**

The point of departure for this study was the assumption that the combination of stroke and reduced chewing and swallowing function affects both the general and the oral health-related quality of life. Responses to questions concerning how older stroke survivors perceive their quality of life show that it is important to maintain normal everyday activities and independence in order to maintain the general quality of life.

### **«The majority of the informants with paralysis and impaired chewing and swallowing function need extra time to eat meals.»**

Responses to questions about how impaired oral function impacts on the eating situation and social contexts show that the majority of the informants with paralysis and impaired chewing and swallowing function need extra time to eat meals. In order to enjoy the meal experience, this group also prefers soft, easily chewable food that is cut into small pieces, and/or help to cut the food up.

### ***Stroke survivors have reduced oral health***

These findings support earlier studies showing that oral health-related quality of life is significantly reduced in stroke patients (13). Evidence shows that the oral health-related quality of life is reduced in line with the degree of impairment in the patient's physical function and with the standard of their oral hygiene. The oral health-related quality of life was also proportional to the number of teeth they had lost (14).

Impaired upper limb function and self-perceived poor oral health adversely affect the quality of life in stroke survivors with paralysis, and can lead to cultural resignation in the form of reluctance to participate in social occasions (15).

Significantly reduced levels of oral function have a particular impact on mental and psychosocial factors. Impaired speech function leads to social isolation. Reduced sensitivity and a loss of muscle coordination in the oral cavity reduce the patient's ability to control their food and/or dentures. In addition, dribbling, slow eating and problems with using cutlery lead to a feeling of shame and low self-esteem (13–15).

Functional impairments and paralysis cause many informants to struggle with using a knife and fork. Impaired chewing and swallowing function leads to fears of food becoming lodged in the throat, or of dribbling or making a mess. They therefore prefer to eat with people who are familiar with their situation.

The interview responses to users of removable dentures show that eating, chewing and swallowing problems are exacerbated, sometimes leaving stroke survivors feeling stigmatised. They deliberately avoid eating with others, or restrict their eating, or only eat certain foods. Reduced food intake over time can cause malnutrition, particularly in those living alone without anyone to help at mealtimes.

### ***Challenges of brushing own teeth***

All the informants brushed their teeth themselves, and with one exception, now attended regular dental health check-ups. However, four informants experienced tooth loss or reduced denture function as a direct result of inadequate oral follow-up during stroke rehabilitation.

Paralysis of the mouth and facial muscles had an adverse effect on the dentures' fit. Impaired tongue function combined with dry mouth and faulty denture design made it more difficult for the patient to remove food residue from the teeth. These factors increase the risk of bacterial growth (9).

In a follow-up study of 156 Swedish stroke patients, Wertsén et al. were disappointed to learn that more than one third of those with paralysis in their dominant hand brushed their teeth themselves. The researchers point out the need for assistance with dental care in patients with paralysis in their hands. Given this finding, it is concerning that all participants in our study brush their teeth themselves.

Wertsén et al. highlight the need for more information about the risk of oral disease for stroke patients, their families and care staff. They also call for a stronger focus on encouraging more contact and follow-up from dental professionals.

They further advocate better routines for the transfer of patient information concerning the need for assistance from the hospital to the local authority. Facilitating the flow of information to patients' families may also lead to improved oral health and reduce the risk of post-stroke pneumonia (16).

### ***Better oral follow-up could improve oral health***

In this study, it was found that informants experienced reduced oral health and loss of teeth as a result of inadequate post-stroke follow-up of dental health. There is reason to believe that a greater focus on oral health could have prevented this.

In the questionnaire that formed the basis for the qualitative study, only 5 per cent of the stroke patients received information about dental care in the acute stage (2). Strengthening the interdisciplinary cooperation, both in the acute stage and the rehabilitation stage, is therefore vital.

Poor oral health following a stroke can be considered a growing problem due to the ageing population pushing up the stroke rate. In the acute stage, swallowing capacity and nutrient intake are prioritised, as this is important to survival in the short term. Paralysis and impaired motor skills often mean that patients do not always notice poor oral hygiene or oral ulcers, or are unable to take care of their own oral health.

The association between poor oral hygiene and aspiration pneumonia due to food going down the wrong way and/or inadequate oral care has been demonstrated. It is therefore recommended that the patient's oral health is addressed at the acute stage and is incorporated into the daily routine at stroke units (17).

### **«Poor oral health following a stroke can be considered a growing problem due to the ageing population pushing up the stroke rate.»**

A study at 11 stroke units in England revealed a similar need for knowledge. The majority of stroke units (72.7 per cent) neither logged oral care nor used a screening form to evaluate oral care as part of their medical record-keeping (18).

Comprehensive documentation from a number of studies thus indicates a need for better routines, instruction and guidance for nurses and other care staff in relation to oral assessments, oral care and in assisting patients to brush their teeth (9, 14, 16–18).

Stroke patients with functional impairments need assistance with oral care and follow-up. The spotlight should be directed towards problems related to chewing (mastication) and swallowing (dysphagia). The latter is a significant risk factor for developing aspiration pneumonia (9).

Consumption of solid food requires some degree of chewing functionality in order to grind the food down to a consistency that can be swallowed. This requires a functional set of teeth or well-fitted dentures.

## **Conclusion**

Sequelae of a stroke can affect the chewing and swallowing function and lead to dry mouth and loss of teeth. The combination of stroke and oral health appears to reduce both general and oral health-related quality of life, which supports findings from similar studies.

Reduced denture function and/or chewing function can leave patients feeling stigmatised in social contexts. It can also lead to reduced food intake and may cause further health complications. Dental health professionals should be involved early in the rehabilitation stage. More interdisciplinary research and a stronger focus on systematic follow-up of this patient group is called for.

## Referanser

1. LHL Hjerneslag. Hjerneslag [Internet]. Jessheim; 10.01.2014 [updated 12.10.2015; cited 20.09.2017]. Available at: <https://www.lhl.no/lhl-hjerneslag/fakta-om-hjerneslag/hjerneslag/>
2. Myhrer T, Haugen KH, Willumsen T, Bergland A. Tannhelse og livskvalitet hos personer etter hjerneslag. Sykepleien Forskning. 2014;9(2):114–122. DOI: [10.4220/sykepleienf.2014.0085](https://doi.org/10.4220/sykepleienf.2014.0085)
3. Lov 28. februar 1997 nr. 19 om folketrygd (folketrygdloven). Available at: <https://lovdata.no/dokument/NL/lov/1997-02-28-19> (downloaded 21.09.2017).
4. NOU 2005: 11. Det offentlige engasjement på tannhelsefeltet. Et godt tilbud til de som trenger det mest. Oslo: Departementenes servicesenter, Informasjonsforvaltning; 2005.
5. Lov 3. juni 1983 nr. 54 om tannhelsetjenesten (tannhelsetjenesteloven). Available at: <https://lovdata.no/dokument/NL/lov/1983-06-03-54> (downloaded 20.09.2017).
6. Anker C. Gratis tannbehandling. Oslo: Helsenet; 2004. Available at: <https://www.helsenett.no/207-sykdommer/tannhelse/tannhelse/1616-gratis-tannbehandling.html> (downloaded 20.09.2017).
7. Yousefi S. Mange lavtlønte dropper å gå til tannlegen. Oslo: Aftenposten; 17.07.2017. Available at: <https://www.aftenposten.no/norge/i/zqVWw/Mange-lavtlonte-dropper-a-ga-til-tannlegen> (downloaded 18.09.2017).
8. Lunde ES, Otnes B, Ramm J. Sosial ulikhet i bruk av helsetjenester – kartleggingsrapport fra SSB. Oslo/Kongsvinger: Statistisk sentralbyrå; 2017. Report 2017/16. Available at: [https://www.ssb.no/helse/artikler-og-publikasjoner/\\_attachment/312917?\\_ts=15de5f0f480](https://www.ssb.no/helse/artikler-og-publikasjoner/_attachment/312917?_ts=15de5f0f480) (downloaded 20.09.2017).
9. Kwok C, McIntyre A, Janzen S, Mays R, Teasell R. Oral care post stroke: a scoping review. Journal of Oral Rehabilitation. 2014;42(1):65–74.

10. Dalen M. Intervju som forskningsmetode – en kvalitativ tilnærming. 2. ed. Oslo: Universitetsforlaget; 2011.
11. Kvale S. Det kvalitative forskningsintervju. Oslo: Ad Notam Gyldendal; 1997.
12. Kvale S, Brinkmann S. Det kvalitative forskningsintervju. 3. ed. Oslo: Gyldendal Akademisk; 2015.
13. Schimmel M, Leemann B, Chistou P, Kiliaridis S, Schnider A, Herrmann F, et al. Oral health-related quality of life in hospitalised stroke patients. *Gerodontology*. 2011;28(1):3–11.
14. Jang E, Kim E, Lee K, Lee H, Choi Y, Hwang T, et al. Oral health related quality of life and it's related factors of stroke patients at home in Korea. *Archives of Gerontology and Geriatrics*. 2014;61(2015):523–8.
15. Da Silva F, Da Silva D, Mesquita-Ferrari R, Fernandes K, Bussadori S. Correlation between upper limb function and oral health impact in stroke survivors. *Journal of Physical Therapy Science*. 2015;27(7):2065–8.
16. Wertsén M, Zellmer M, Arnesson L. Förbättra munvårdsråden till strokepatienter. *Tandläkartidningen*. 2011;103(15):74–9.
17. Åsberg KH, Wertsén M, Wårdh I. Dålig munhälsa efter stroke ett växande problem. *Läkartidningen*. 2011;108(39):1910–2.
18. Horne M, McCracken G, Walls A, Tyrrell P, Smith CJ. Organisation, practice and experiences of mouth hygiene in stroke unit care: a mixed-methods study. *Journal of Clinical Nursing*. 2014;24(5–6):728–38.