NorVIS 2nd Young Researchers Conference 2024: Abstracts

The second NorVIS Young Researchers Conference was held at the University of South-Eastern Norway (USN) in Kongsberg on the 28th of May, 2024. This year, it was a hybrid conference with digital attendance from Sweden and Bergen to accommodate those unable to travel. The primary goal was to share knowledge, experiences and projects for researchers in the start of their careers and to stimulate to more vision and brain research. Further, it is an arena for discussing clinical problems and research ideas, and to network with other professionals working in the field (Mathisen et al., 2023). The one-day meeting had presentations including study protocols, masters' projects, PhD and post-doctoral clinical research from a variety of professionals. The interdisciplinary professions included a neuropsychologist, a specialised nurse, occupational therapists, a speech therapist and optometrists. After the presentations, Jan Johansson and Helle K. Falkenberg shared their tips and experiences on writing abstracts for papers and conferences. The meeting was organised by Torgeir S. Mathisen and Helle K. Falkenberg from USN and was partly financed by the NorVIS network, www.synogslagnett.no. The abstracts from contributed authors are listed in the order of presentation.

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Vision assessment of patients with acquired brain injury — occupational therapists' experience with the KROSS tool

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Abstract

Vision problems are common after acquired brain injury (ABI) and affect quality of life, independence, and participation in meaningful activities and everyday life. Healthcare professionals lack experience, knowledge, and routines to secure effective vision care as part of the patient pathway (Falkenberg et al., 2020; Rowe, 2017). This study assessed the experiences of occupational therapists (OT) with the KROSS vision assessment tool (Falkenberg et al., 2016; 2024) in a specialist healthcare unit for rehabilitation.

Six OTs participated in the project. First, they were given a short introduction to the most common vision problems caused by ABI and trained in using the KROSS tool. They participated in a focus group interview before, during and after using the KROSS tool for three months. Data were analysed using thematic analysis. Four main themes were identified: 1) Determinants for implementation; 2) Vision assessment should be included in the activity analysis; 3) Difficult, but useful, to assess vision in ABI patients and 4) We have identified a vision problem; Now what?

Despite their lack of expertise in and knowledge of vision problems after ABI, OTs found the KROSS tool beneficial for performing vision assessments, leading to more appropriate follow-up plans. They felt uniquely positioned to identify vision issues due to their focus on activity and participation. However, they noted limited and unclear guidelines within their unit and the healthcare system, emphasising the need for leadership, training, and easy-to-use tools. The KROSS tool increased their understanding and focus on vision problems, boosting their confidence in working with patients and caregivers, and ensuring quicker follow-up. The study highlighted the need for a structured patient pathway for vision rehabilitation and pointed out the systemic lack of competence in handling vision problems in healthcare services.

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The effect of coloured overlays for adults with acquired brain injury or post Covid-19

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Abstract

Reading difficulties are common after neurological conditions such as acquired brain injury or Covid-19. Visual stress is a possible cause of reading disturbances and is associated with symptoms of eyestrain, headaches and distortions of visual perception when viewing striped patterns, including lines of text.

There is evidence suggesting that coloured overlays can alleviate symptoms of visual stress and improve reading speed. An increased reading speed of 5% is predicting a long-term use of the overlay. The purpose of this study was to study the effects of coloured overlays on word fluency and reading experience. Two Swedish studies investigated the effect of overlays in patients with neurological symptoms and reading difficulties after acquired brain injury ($n = 30$) and Covid-19 ($n = 30$).

The overlays used in these studies were developed in the UK. The impact of the individually chosen overlay was measured using the Wilkins Rate of Reading test. All patients were assessed for mental fatigue, visual discomfort, and visual functions.

Preliminary results showed a significant increase in reading speed by 6.5% with the overlay of choice compared to reading without ($p < 0.001$). Most participants with post Covid-19 chose overlays with blue and purple shades (blue, purple, lilac, and aqua). A majority of the patients (83.3%) experienced positive visuo-perceptual effects when using the overlay. Visual discomfort correlated positively with mental fatigue ($r = 0.67$, $p < 0.001$). Overlays showed promise as an aid for patients with reading-related problems after ABI or Covid-19. Current findings and planned progress of the studies will be discussed in the presentation.

Assessing vision after acquired brain injury — a survey of current healthcare practice in Sweden

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Abstract

Many suffer from acquired brain injury (ABI) every year. The visual system is complex, involving many areas in the brain. Therefore, an injury to the brain often causes visual problems such as blurred vision, visual field loss, hypersensitivity to light and glare, double vision, visual inattention and other visual perceptual problems (Hepworth et al., 2021). Visual impairments (VI) cause reduced participation in activities in daily life and social activities, and patients often report reduced quality of life. It is therefore important to assess vision after ABI to identify vision related difficulties and offer appropriate care and rehabilitation (Berthold Lindstedt et al., 2019; Falkenberg et al., 2020; Johansson et al., 2020). In the Swedish healthcare system there are no common guidelines for assessing vision after ABI and little is known about current healthcare practice.

The primary aim of this study was to describe the current practice for assessing vision after ABI in Swedish healthcare. As part of a Nordic study, we translated a Norwegian and Danish survey (Schow et al., 2024) to Swedish. The web survey was sent to key persons and occupational therapists (OTs) in Swedish neurorehabilitation care settings. Information about the survey was also shared using social media and work networks. The questionnaire contained 24 questions concerning routines and teamwork, assessment tools and perceived barriers, and the target group was healthcare personnel of various professional categories meeting ABI patients in the Swedish healthcare. ABIs caused by concussion and Covid-19 were excluded.

Forty-three surveys were returned in full, representing all six Swedish healthcare regions. Most respondents (56%) were OTs, 11 (26%) had a routine for identifying VI at their workplace, while 16 (37%) stated that vision assessment was part of the general medical examination. Assessment was mostly carried out by OTs and physicians, and 9 (21%) reported that their workplace had a specialised interprofessional team identifying VI. Only 8 (19%) routinely assessed visual function in all patients with ABI, 21 (49%) examined vision when VI was suspected. Many did not use standardised tests (49%) or questionnaires (61%). Respondents who had a routine for identifying VI used standardised tests and questionnaires more often than those without ($p = 0.001$). Two thirds of the OTs stated that limited knowledge and skills in identifying VI was very challenging.

The results of this study confirmed the lack of clear guidelines and showed that practices for identifying VI vary greatly across Sweden. The lack of routinely performed structured assessments leads to unequal access to adequate care and rehabilitation after ABI. The study also revealed that OTs often were responsible for assessment and rehabilitation after ABI. Further, there is a need for more knowledge and competence in VI, across disciplines.

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Measures and rehabilitation of visual field deficits for driving — protocol for an intervention study

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Abstract

Driving is crucial for people's sense of independence in both daily life and societal activities. The loss of a driver's licence is associated with reduced quality of life, depression, and mortality (Falkenberg et al., 2020; Mathisen & Eilertsen, 2016; Sand et al., 2018). Stroke and glaucoma, the most common causes of visual field deficits, often lead to individuals not fulfilling the driving standard regulations. However, people can learn to compensate for their visual field loss but need rehabilitation to adopt efficient strategies. Despite this, visual rehabilitation is not part of Norwegian health services. Further, many perceive the Driving Licence Regulations as problematically strict, arguing that the standard static method for measuring the field of vision does not reflect the ability to drive safely (Harper et al., 2022; Sudmann et al., 2022). There is a need for innovative tests or biomarkers that can measure any experienced improvements in the functional visual field after vision rehabilitation.

The purpose of this study is to gain knowledge of the experiences, and measured effects, of vision rehabilitation for visual field loss after stroke or glaucoma. The study aims to define markers for the ability to compensate for visual field deficits. Additionally, we will examine the experience of living with visual field loss related to traffic situations. Here we will present parts of the protocol for this mixed-method intervention study. We plan a controlled clinical intervention with data collection before and after the intervention, and at 6 months after the intervention. We aim to recruit 50 persons with the following inclusion criteria: age 30–75, diagnosed with glaucoma or stroke; lost their driver's licence solely due to visual field loss in the last 12 months, motivated to participate in the vision rehabilitation. Ten participants will be asked to participate in two qualitative individual interviews about their experience of compensating for visual field deficits and functioning in traffic, as well as their motivation and experience before and after visual rehabilitation. Recruitment will be carried out over 18 months via patient organisations, stroke units, sub-acute rehabilitation units, NorVIS network and optometrists.

The intervention will be person-oriented visual rehabilitation

or standard clinical follow-up (control), using block randomisation with a cohort size between 2 and 6. Data collection before and after the intervention will include standardised methods in optometry, neuropsychology, and rehabilitation. Standard optometric assessments will include, visual acuity, visual field (Octopus 900), innovative VR-technology (BulbiCAM), reading (IReST), ADL and quality of life-related tests and self-reporting questionnaires. The interviews will be analysed using thematic analysis.

This study has potential benefits for the individual person, for the stroke and glaucoma population, and for optometrists and other healthcare professionals. Identification of relevant biomarkers can be used to inform further studies on how we understand and measure visual field, particularly related to driving. Further, it will give important insight into the experience of compensating for visual field loss and how it impacts losing one's driving license, and participation in vision rehabilitation.

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Public knowledge of visual stroke symptoms: a systematic literature review

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Abstract

A quick response time to treatment is essential for improving outcomes after a stroke. The public stroke symptoms campaign, known as FAST, which stands for Facial mimic (F), lifting Arms (A), Speaking (S), and Time (T), does not include vision (Rioux et al., 2022). However, approximately 30% of stroke patients do not recognise sudden visual problems as a symptom of stroke. This lack of knowledge causes unnecessary delays in contacting emergency stroke care services. Enhancing knowledge could promote greater awareness and encourage appropriate action among the public. The aim of this systematic literature review was to explore public knowledge of visual stroke symptoms.

The literature review followed PRISMA guidelines. The authors searched Medline, Scopus, CINAHL and comparable electronic databases. Blinded evaluation of title and abstracts were done by three researchers, including IL and HKF, and discrepancies were solved by a fourth. Articles inclusion criteria were: English or Nordic language, informants age >18 years, results presented public, or stroke survivors' knowledge of vision symptoms related to stroke. STROBE reporting guideline was used to assess the quality of reporting in the papers. This study is part of a larger updated review, and preliminary results are presented.

The search identified 574 articles, where 21 articles met the inclusion criteria and authors' STROBE quality evaluation. The articles represented 480 548 informants from 13 countries across the world. Most studies assessed knowledge through interview or self-administrated questionnaires. Preliminary analysis showed that the knowledge of vision symptoms of stroke was low. Further, vision symptoms and visual problems were described in many different terms, including blindness, blurry vision and tired eyes. The results suggest that there is a need for more precise and uniform communication on how to identify and act on stroke related vision symptoms to the public. In order to improve vision and stroke related health competencies in the public, a clear set of symptom descriptions that accurately identify the most frequent visual stroke symptoms, and a strategy to implement this knowledge in public health campaigns are required.

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Sensitivity and specificity of the Norwegian KROSS tool for vision assessment after stroke

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Abstract

Over 60% of stroke survivors have visual problems (Rowe et al., 2019). These include central vision issues, visual field defects, eye movement deficits, and visual perception problems. It is crucial to assess vision post-stroke for rehabilitation, but this is not routine in Norwegian stroke care. Here we will present the results of a study aimed to validate the KROSS tool, developed for identifying post-stroke vision problems (Falkenberg et al., 2016; 2024; Mathisen et al., 2021). The KROSS tool, created with Norwegian stroke and rehabilitation services, has 21 items related to symptoms, observations, and assessments of visual acuity, field, movements, and inattention. All are scored binary (problem present or not). Sixty-seven stroke survivors were assessed twice: first by a healthcare professional without formal vision competence, then by an optometrist/KROSS specialist within two days. Sensitivity, specificity, predictive values, and inter-rater reliability were calculated using Kappa values and Gwet's Agreement Coefficient.

The KROSS tool demonstrated high sensitivity (98%) and specificity (83%), excellent reliability (AC1 > 0.86/Kappa > 0.83), and observer agreement (93%). Vision problems were

identified in 64% of cases, with 44% of patients reporting vision symptoms. The tool had high positive and negative predictive value and negative predictive values (> 0.9). High specificity scores (> 70%) were observed for all items, with most showing excellent or substantial agreement (AC1 > 0.7 / Kappa > 0.6). Almost all patients were referred to an optometrist for further follow-up.

The KROSS tool exhibited high levels of sensitivity, specificity, and reliability. The high agreement scores suggest that non-vision specialists without formal vision competence could effectively assess and identify the presence of a vision problem. The results also indicate that most patients with newly identified, or inadequately managed known vision problems could be referred to an optometrist for further assessment and rehabilitation. Vision assessment should be integrated into stroke care, serving as an indicator of high-quality service delivery for stroke survivors.

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