ORIGINAL ARTICLE

The Current Provision of Post-Stroke Vision Care in Malaysia: A Qualitative Interview Among Stroke-Care Professionals

Eli Aimi Shakira Amran[1], Azrin E Ariffin[2], Mohd Said Nurumal[3], Mohd Zulfaezal Che Azemin[1], Azuwan Musa[4,*]

[1]Department of Optometry and Visual Science, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia
[2]Chancellery, University of Cyberjaya, 63000 Cyberjaya, Selangor
[3]Department of Critical Care Nursing, Kulliyyah of Nursing, International Islamic University Malaysia, 25200 Kuantan, Pahang, MalaysiaA
[4]Department of Ophthalmology, Kulliyyah of Medicine, International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia

ABSTRACT

Background: The inequality in care provision for stroke survivors who have visual problems has been reported globally. It revealed that many stroke survivors continue to experience unmet needs concerning their visual problems. Qualitative interviews were conducted with stroke care professionals to explore gaps and loopholes in vision care provisions. **Methods:** A semi-structured interview study using purposive sampling and inductive qualitative content analysis was conducted. A total of 8 stroke-care professionals with more than 10 years of experience from university teaching Hospitals in Malaysia were recruited for the interview from January 2021 to January 2022. A criterion-based sample of healthcare professionals involved in post-stroke care was recruited. Data collection continued until thematic saturation was reached. Ethical approval has been obtained from the IIUM Research Ethics Committee following the principles of the Declaration of Helsinki. **Results:** The central theme is current provision, and there are five main themes identified: indefinite vision care pathways, incomplete eye examination, insufficient referrals, absence of visual rehabilitation, and lack of eye care professionals. All respondents reported that the most common visual impairments seen in their practice were homonymous visual field loss and visual neglect. However, the care pathway for assessing visual impairment remained unclear and varied among professionals. In outpatient services, rehabilitation mainly focuses on improving bodily function and activities of daily living. There is also a need to include optometrists and ophthalmologists specializing in neuro-vision care in the rehabilitation team. **Conclusion:** This study shows that there are gaps and loopholes in the current provision of post-stroke vision care in Malaysia. A standardized protocol in the country should be developed to give a clear pathway for managing vision after a stroke.

Keywords:
Visual Impairments, Post-Stroke Vision Care, Visual Care Pathway, Optometrist

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INTRODUCTION

Globally, stroke is a major cause of mortality and disability (Johnson et al., 2019). In 2019, the Global Burden of Disease has reported that there were 101 million prevalent cases of stroke, 12.2 million incident cases of stroke, and 6.55 million deaths from stroke. Stroke remained the second-leading cause of death and the third-leading cause of death and disability-adjusted life years (DALYs) in 2019 (Feigin et al., 2021).

Many studies have been conducted in Malaysia aimed at improving the care of patients with stroke (Cheah et al., 2016). However, none of the studies to our knowledge have specifically reported on the post-stroke vision problems and care among stroke survivors. Thus, the prevalence of visual impairment after stroke in this country is unknown and underreported. Abnormalities of central and/or peripheral vision, eye movements, and a variety of visual perception problems, such as inattention and agnosia, are examples of visual impairment that can affect the visual function of stroke patients (Pollock et al., 2012).

The most common visual symptoms were blurred or altered vision (22.1%), visual field loss (12.6%), diplopia (9.9%), and reading difficulties (9.7%) (Hepworth et al., 2021). In one study, 703 were identified to have a new visual impairment, and 47.1% reported visual symptoms. No visual symptoms were reported by 38.4%, and 14.5% were unable to report symptoms (Hepworth et al., 2021). Stroke survivors may or may not have visual symptoms, i.e., the patient reports the effect of their visual impairment (Pollock et al., 2019).

Corresponding author.
E-mail address: azuwan@iium.edu.my

The inequality in care provision for stroke survivors who have visual problems has been reported in the UK (Rowe et al., 2015). It reports that many stroke survivors continue to have unmet needs regarding their visual problems. In Malaysia, there is no study regarding vision care for post-stroke patients. Thus, the objective of the present study is to investigate the current vision assessment and management and rehabilitation of stroke survivors among professionals. The main research question of the study is on the current provision of post-stroke vision care in Malaysia, investigating the gaps and loopholes in the current provision of post-stroke vision care and how effectively the current available protocol and tools help the post-stroke patients in managing their vision.

MATERIALS AND METHODS

This study is a descriptive qualitative study that investigates gaps and loopholes in the current provision of post-stroke vision care in Malaysia. The research methods and the reporting follow the Consolidated criteria for reporting qualitative research (COREQ; Tong, Sainsbury & Craig, 2007). Any research material related to the study is available from the corresponding author.

Eight stroke-care professionals (2 neuro-ophthalmologists, 1 Neurologist, 2 Rehab-Physicians, 2 Geriatricians, and 1 Emergency Physician) from Teaching University Hospitals in Malaysia were recruited for the interview (see Table 1). Our participants were selected by purposeful sampling. Sampling decisions were made a priori based on reasonable criteria rather than theoretical saturation (selective sampling). Based on our research question, the following factors were found to be varied: professional group, discipline, and care setting. A criterion-based sample of healthcare professionals involved in post-stroke care was recruited. Data collection continued until thematic saturation was reached. The relevant professional groups and care settings were identified by the author concerning the Stroke Clinical Practice Guidelines 2020. At least one representative was included. Criteria for inclusion are as follows (1) representative of one of the defined professional groups and care settings; (2) in a leading position with major responsibilities (e.g. senior physician, medical director, and head of department): (3) special interest in the research question. This corresponds to common definitions of persons with special expertise (Morse, 1994). Exclusion criteria were as follows: (1) no interest in the research question.

Table 1: Profile of the stroke-care professionals

Initial	Age	Gender	Year of experience	Designation
Dr A	60	Male	35	Neuro-Ophthalmologist
Dr B	57	Male	35	Neuro-Ophthalmologist
Dr C	39	Female	12	Geriatrician
Dr D	50	Female	25	Rehabilitation Physician
Dr E	44	Male	18	Emergency Physician
Dr F	44	Female	18	Neurologist
Dr G	48	Male	15	Rehabilitation Physician
Dr H	41	Male	18	Geriatrician

Data Collection

The first author (E.A.) contacted participants by informing them via email about the study background, methods, and data protection, and gave written or verbal consent to their participants. Personal interviews were conducted following a semi-structured interview guide, which was conducted in English. The resulting interview guide was discussed and developed based on references by Rowe et al. (2022). The interviews were conducted from Jan 2021 until Jan 2022 by the first and second authors (E.A.) and (A.M). All interviews were audio-taped and transcribed verbatim. Words or phrases stressed by the interviewees were transcribed in capital letters. The transcripts were not returned to the participants to avoid censoring and corrections. Although member checking was not undertaken, credibility was strengthened through an audit trail, reflexivity, peer debriefing among research colleagues, and data triangulation (Braun & Clarke, 2022). These strategies enhanced methodological transparency by documenting analytic decisions, ensuring interpretations were grounded in participants' data, and providing sufficient contextual detail for readers to assess trustworthiness (Braun & Clarke, 2019). The study protocol and materials have been reviewed and approved by the IIUM Research Ethics Committee (IREC 2022-091).

At the beginning of each interview, the objective of the study was explained to the participant. The research aims to explore the current provision of post-stroke vision care in Malaysia among stakeholders and find gaps and loopholes in this provision. Participants were then asked questions related to their practice and experience with the current practice. The four questions that were asked in this research are visual problem, visual care pathway, current provision, and management (Appendix 1). At the end of

the interview, participants could add anything else they found related to the current post-stroke vision care. Personal information was collected on the participants' age, gender, and years of professional experience since graduation, their profession, and additional training or qualifications. The interview took between 20 and 60 minutes.

Data Analysis

The interviewer analyzed the transcripts using macroanalysis and microanalysis, open coding, and thematic analysis (see Table 2 and 3). We extracted all information referring to our research question and summarized it into categories, checking back with the original data.

Macroanalysis examines data at a broader level (categories), and microanalysis is more detailed and line-by-line in data (initially coded and subthemes) (Braun & Clarke, 2022). ATLAS.ti (CAQDAS) that helps organize, code, retrieve, and interpret qualitative data systematically.

The resulting categories were then organized into five main categories (indefinite vision care pathways, gross eye examination, insufficient referrals, absence of visual rehabilitation, and lack of eye care professionals' involvement). Content, coding rules, and prototype examples were defined for each category to increase transparency and reliability (Pope, Van Royen & Baker, 2002). Two researchers (E.A. and A.Z.) first analysed the interview separately. Consensus was reached, and if necessary, the codebook was adapted. The remaining interviews were coded by one of the two researchers and checked by the other researcher. Discrepancies were discussed until consensus was reached. Results, progress, and data saturation were discussed during the process (Lotz et al., 2015).

Table 2: The structure of open coding

Raw Data (Quote)	Initial Code	Category/ Subtheme	Theme
"So usually, its just by clinical examination, for example hemianopia just do cancellation test and phenol red dot test. So, if we detect it, normally we will refer to Ophthalmology for a proper charting. There are no local or or international care pathways available''	No standard pathway	General visual outcome/not specific	Gross Eye Examination

Table 3: The process of open coding

Example of data	Its just picked up at clinical examination. So for diplopia actually there is nothing. For neglect at least we refer to Ophthalmologist and they will do the charting. I forgot the name of the chart to actually quantify the visual field. If it is neglect also we tend to use the general visual neglect outcome measures or scales but that one is not specifically for visual neglect. Only looking at general aspect	Ya, that's why we don't have that much for vision. For physical therapy, I don't think that much. But some physical therapy they are also aware to do on scanning. Most of it will be done by occupational therapist. Again, it is mainly compensatory and stimulation. They are not trained and we used to have one or two training for low vision rehab but that also is very basic so basically if its low vision rehab also sometimes, we will refer back to other NAD? Or other cases
Initial codes	General General visual outcome/not specific	Basic Examined or trained by non-professionals
Initial sub-themes	Gross Eye Examination	Lack of Eye Care Professionals' Involvement

RESULTS

After 8 interviews, a few new codes and themes emerged from the data. Therefore, we decided to stop further recruitment of participants. The 8 participants were from a teaching university hospital. The participants consisted of 8 professionals with stroke (5 men and 3 women) with a mean age of 64 years (SD = 15) and an average of more than 10 years of experience.

Thematic Analysis

The themes that explain the current provision of post-stroke vision care were 1) Indefinite Vision Care Pathways with two categories which are varied care pathways and non-standard protocols 2) Gross Eye Examination with three categories which are lack of comprehensive eye examination, assessment based on patient complaint and insufficient information regarding visual impairment; 3) Insufficient referral with two categories which are lack of coordination between healthcare providers and absence of multidisciplinary approach; 4) Absence of visual rehabilitation focusing on visual rehabilitation and basic education/training among physicians; 5) Lack of Eye Care Professionals Involvement which are non-involvement of Optometrist and Ophthalmologist in emergency and ward and insufficient expert on visual rehabilitation. Table 4 illustrates the identified Themes and Categories.

Table 4: Themes and Categories of the current provision of post-stroke vision care

Themes	Categories
Theme 1 Indefinite Vision Care Pathways	Varied care pathways Non-standard protocols
Theme 2 Gross Eye Examination	Lack of comprehensive eye examination Assessment based on patient complaint Insufficient information regarding visual impairment
Theme 3 Insufficient Referrals	Lack of coordination between healthcare providers Absence of multidisciplinary approach
Theme 4 Absence of Visual Rehabilitation	Focusing on physical ability Basic education/training on visual impairment among physicians
Theme 5 Lack of Eye Care Professionals Involvement	Non-involvement of Optometrist and Ophthalmologist in emergency/ward Insufficient expert on visual rehabilitation post-stroke

Theme 1: Indefinite Vision Care Pathways

This theme refers to the current management strategies that are available for stroke patients who are experiencing vision loss or visual impairments. Varied care pathways among professionals within a healthcare system, depending on their current protocol and preferences. There are no standardized post-stroke vision care pathways to be followed by professionals. The non-standardization of care pathways leads to confusion and reduces the quality of life in stroke patients' care, and also reduces efficiency in the management.

…So usually, it's just by clinical examination, for example hemianopia just do cancellation test and phenol red dot test. So, if we detect it, normally we will refer to Ophthalmology for a proper charting. There are no local or international care pathways available… (G, Dr)

…So far no. We will handle with what we usually do. Unless patient request for anything extra, patient will go and seek by themselves. Because we are the referral centre already. Limited resources here… (H, Dr)

Currently, the protocol for post-stroke vision care is non-standardized. Clinical Practice Guidelines for the Management of Stroke 2020 (CPG 2020) stated that confrontation is the only method to detect any visual impairment in post-stroke patients which is insufficient and not addressing the possible visual impairments.

…In the emergency unit, only physical examination, which is confrontation. I am not sure in terms of the pathway for visual impairment when the patient is in the ward… (E,Dr)

Theme 2: Gross Eye Examination

Gross eye examination limits its ability to fully evaluate the

extent of vision impairments and the specific needs of stroke patients. Gross eye examination also limits the sensitivity and specificity of the diagnosis. Lack of comprehensive eye examination can lead to misdiagnosis and may delay the recovery and rehabilitation of the visual impairment.

…It's just picked up at clinical examination. So, for diplopia actually there is nothing. For neglect at least, we refer to Ophthalmologist and they will do the charting. I forgot the name of the chart to actually quantify the visual field. If it is neglect also we tend to use the general visual neglect outcome measures or scales but that one is not specifically for visual neglect. Only looking at general aspect… (G, Dr)

…Because if we assess through clinical examination such as confrontation is not accurate. We can get rough estimation but not accurate… (A, Dr)

Assessment based on patient complaints were reported by the geriatrician, neurologist, and also rehabilitation physician. If one complaint were made by patients, then only the related department will refer for further assessment. However, visual symptoms are frequently poorly described by patients, particularly where individuals have coexistent communication and cognitive impairments (Hepworth et al., 2015).

…As a comprehensive check, we will check the vision but if they only present visual impairment, if junior doctor examined they might miss the sign of stroke. If it is only visual impairment because they might think that as other ophthalmological problem. So, then the awareness has to be more. There is benefit if either the doctor, staff or patient aware that visual impairment can be part of stroke presentation… (Dr D)

Insufficient information regarding stroke and visual impairment among patients was also reported by professionals because patients usually did not complain and did not aware if the symptoms they have is related to vision.

…First challenge is awareness among the patient. One is about stroke. Then if they can recognize the stroke, emergency of the stroke such as if the patient comes fast to emergency. Like I said there is a window treatment. Third, awareness regarding our stroke centre. They will go nearby hospital instead of stroke centre. Fourth, it is a university hospital, not KKM… (Dr E)

Theme 3: Insufficient Referrals

There is a lack of coordination between healthcare providers. When coordinated care is absent, each healthcare provider might not be aware of each other's assessments and treatment plans, which could lead to misdiagnosing. For example, a patient might see a general neurologist who focuses on neurological recovery but does not communicate or there is no service for a neuro-ophthalmologist, meaning visual issues like hemianopia or visual neglect might go unnoticed or untreated.

…Usually the management is just assessed and most of the patient has diabetes is just follow up on that. There is no real advice on visual field or visual neglect on how to rehabilitate or any guideline from that. So usually, honestly, we will refer so if what happens also did not really matter to us. Even from patient's point of view also we do not really educate the patient that much. We just assess, tell the patient's condition and it may recover or not recover its just wait and that's it. There is no real or active therapy on their side… (B, Dr)

The absence of a multidisciplinary approach in post-stroke vision care can limit the recovery and efficiency of the treatment for stroke patients who have visual impairments. Visual impairment caused by strokes involves neurological, ophthalmological, and rehabilitative issues. All professional disciplines are important to be coordinated so the patient may receive comprehensive, integrated care that can address the suitable management.

…So, to be honest for visual perception, visual neglect and stuff are something that we read about but we do not really practise. Again, in Malaysia it is very limited to refer to. We are supposed to start our low vision clinic but we have not started yet. Our occupational therapist is sent for training but I think they are not comfortable to do it. Like, for stroke in terms of stimulation for Ophthalmoplegia, it's a bit more on visual neglect but it is more on compensatory method approaching from affected side and using bright light or photos and ophthalmoplegia. I will ask him on function like looking left, looking right and find to follow object. There is no real therapy where you can measure the outcome. Ideally you can actually measure, do it and measure again. And see if its good or not… (D, Dr)

Theme 4: Absence of Visual Rehabilitation

Focusing on physical ability but not visual rehabilitation in post-stroke patients can negatively impact stroke survivors. Especially to those with visual impairment after strokes. Visual impairments after stroke can significantly affect a person's ability to be independent and have a better quality of life. When health care professionals ignore the importance of visual rehabilitation, it can lead

to long-term disability and diminished recovery in stroke patients. It will also hurt cognitively and emotionally.

…Yes, if it is diplopia, it can cause visual problem and also hemianopia. The main thing that I worry about is falls. If they have stroke, and they are walking, the balance and power is not so good. On top of that, any visual problem will cause functional issue, easier to fall, and for neglect, like eating and day to day activities… (D, Dr)

Only basic training on visual impairments was provided to the majority of the professionals. It is a critical issue as it can hinder recovery. Visual impairments can go unnoticed if professionals in healthcare lack the required knowledge and skill for visual rehabilitation.

…Yes, just a basic clinical exam, cranial nerve check, visual acuity, like the patient standing away from the chart and just read of the lines… (D, Dr)

Theme 5: Lack of Eye Care Professionals' Involvement

The non-involvement of optometrists and ophthalmologists in emergency/ward can also hinder the timely diagnosis and treatment of vision problems that the stroke survivors experience. As visual impairment is a common consequence of stroke, stroke survivors must receive appropriate care, and the visual professional to be in the team to make an appropriate diagnosis and referral for further assessment or therapy (Rowe et al., 2020).

…Ya, that's why we don't have that much for vision. For physical therapy, I don't think that much. But some physical therapy they are also aware to do on scanning. Most of it will be done by occupational therapist. Again, it is mainly compensatory and stimulation. They are not trained and we used to have one or two training for low vision rehab but that also is very basic so basically if its low vision rehab also sometimes, we will refer back to another NAD? Or other cases… (F, Dr)

…Yeah, I think that will be helpful. Like I said, it mainly just the doctors who do the clinical examination to pick up such conditions, and formal visual acuity tests are not done. Unless the patient complains that their visual acuity is different than before, and I said for retinopathy, funduscopy can also be done… C, Dr)

Currently, in the country, there is an insufficient number of experts on visual rehabilitation post-stroke. Optometrists and ophthalmologists are encouraged to equip themselves with the knowledge in visual rehabilitation as we have a shortage of expertise in this field.

…Ya, so if it is neglect, of course we can here be we do a lot of stimulation from the affected side. If it is diplopia, we get our occupational therapist to teach some compensation method. Either eye patching and everything if it is severe. If it is neglect also we will teach visual scanning or head turning or scanning. Those are compensatory mechanism and there is no real eye therapy for that. I mean if there is ophthalmoplegia, the most we get to do is to get the patient to practise moving or looking object up, down, left and right. Recently, I think through Prof M's contact, Neuro-Optometrist has joined us for certain prism and assessment…(Dr D)

DISCUSSION

This qualitative research aims to investigate the current provision of post-stroke vision care among professionals involved in treating stroke patients. We study the current practice in visual perception screening and also related eye examinations. The challenges faced by health care professionals were also being studied. The biggest challenges faced by our participants were the non-standardized protocol and lack of expertise.

National Clinical Guidelines for Ischaemic Stroke (CPG 2020) recommend that every stroke survivor who appears to have visual impairment be checked with a confrontation test (Malaysian Society of Neurosciences, 2020). The National Institutes of Health Stroke Scale (NIHSS) was used in the emergency department and the ward. Again, the only visual check is confrontation, which is insufficient and inaccurate. No standard protocol related to vision was mentioned by the participants, except CPG 2020 and NIHSS. After a patient is discharged from the ward, follow-up depends on the severity of the complaints and the patient. Eye examination is not compulsory.

Visual impairment among stroke patients is an under-recognised problem that can cause a significant impact on the quality of life of stroke survivors. All professionals should be aware that visual problems are common to happen in stroke survivors (Rowe, 2016). In the emergency department, visual outcomes of acute central and branch retinal artery occlusions are poor, and acute treatment options are limited by delayed diagnosis (Bénard-Séguin et al., 2024). Retinal optical coherence tomography (OCT) is more detailed and useful in diagnosing compared to normal ocular fundus. But it is seldomnly available in ED (Bénard-Séguin et al., 2024) One study found out that non-mydriatic ocular fundus fundus photography (NMFP) combined with OCT are powerful and can accelerate the detection of early retinal ischaemia. This eye stroke protocol can allow rapid intervention but the education is

also important among professionals in healthcare department regarding acute vision loss among stroke survivors (Bénard-Séguin et al., 2024).

In rehabilitation management, treatment options aim to restore visual function to as normal as possible. Increasing ageing population will result in more stroke survivors requiring rehabilitation and with high prevalence of stroke survivors at a younger age, who are still in working fields, more survivors requiring rehabilitation. Policy makers need to understand the importance of providing post-stroke rehabilitation services including visual functioning (Rowe, 2016). Most of the professionals reported that the condition of the patient is the barrier for standardised assessment (Vancleef et al. 2020). Many tests not designed and not suitable for stroke survivors with aphasia and/or dysarthria (Vancleef et al., 2022)

In hospital settings, FAST helps recognize common stroke signs like Face drooping, Arm weakness, and Speech difficulty, but it may miss visual symptoms. BE FAST adds Balance and Eyes, highlighting that sudden blurred, double, or lost vision can also signal a stroke, especially in the posterior brain. Including Eyes in BE FAST ensures that vision-related strokes are recognized quickly for faster treatment for anterior ischaemic stroke (Tanglay et al., 2024).

The establishment of a visual team is important in the stroke unit. Early assessment and registration of the patient's visual symptoms is needed to provide necessary rehabilitation (Norup et al., 2016). Visual impairment after stroke is common. From a study, about one-quarter of the patients had some kind of visual deficit after stroke (Norup et al., 2016). The majority of the professionals in this study agreed that it is important to involve an Optometrist and Ophthalmologist in the stroke team. It is even more necessary to have a neuro-optometrist in the team to be involved in visual rehabilitation.

A limitation of this study is that participants were recruited from a single tertiary hospital, which may limit the transferability of findings to other settings. Additionally, the sample size was purposively selected, which may not capture the full range of professional perspectives. Despite these limitations, the study provides in-depth, contextually grounded insights into the professional experiences of healthcare providers, which can inform practice, policy, and future research in similar settings.

CONCLUSION

Several gaps and loopholes need to be addressed in current post-stroke vision care among professionals. Standardized protocols need to be implemented to ensure that all professionals deliver comprehensive care, specifically for visual issues. Visual team, Optometrist and Ophthalmologist to be involved as early as in acute care. Continuous training and knowledge about post-stroke vision care among professionals are crucial to avoid misdiagnosis of the visual impairment.

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APPENDIX 1

Pre-coded Qs:

1. What type of visual problem (after stroke) seen?
2. How are these identified?
3. How are these treated and follow-up?
4. What care pathways are used? Any designated care pathway (local/international)
5. What type of visual impairment (visual conditions recognized by the professions)?
6. Are there any options of treatment; personal treatment or referred?
7. Is there any links with other professions and referral options?
8. What is the stroke related general impairments?
9. What is the impact of visual problems?
10. What variable time patients were seen?
11. Is there any screening form used?
12. What is the frequency of visual conditions?
13. Are there various treatment options offered?
14. Are there any patients had no visual symptom but had an eye condition?
15. Have you been trained for an eye exam?
16. What is the scope of treatment for stroke patients?
17. What services are offered?