

RESEARCH REPORT

‘Patient unable to express why he was on the floor, he has aphasia.’ A content thematic analysis of medical records and incident reports on the falls of hospital patients with communication disability following stroke

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Funding information

This research was funded by an Australian Government Research Training Program Scholarship and a Jumbunna Postgraduate Research Scholarship.

Abstract

Background: People with communication disability following stroke are at risk of falls during inpatient rehabilitation. However, they are often excluded from hospital falls research, and little is known about the circumstances or outcomes of their falls to inform risk management strategies.

Aims: To examine hospital medical records and incident reports relating to falls of patients with communication disability following stroke for content codes, categories and themes relating to communication.

Methods & Procedures: This medical record chart review examined data on 72 patients and 265 falls. A content thematic analysis was used to identify how patient communication is characterized in relation to falls, and their prevention and management strategies.

Outcomes & Results: The data reflected that staff viewed patients having difficulty following simple instructions as contributing to falls. Gaining the attention of staff and communicating basic needs were also considered to be contributing factors for falls. Patients were often described as experiencing a fall when taking a risk or attempting to address an unmet basic need. Furthermore, written notes for patients with more severe communication disability reflected that the patient’s communication impairments prevented staff from establishing the circumstances of some falls and complicated the assessment for injury following a fall.

Conclusions & Implications: The medical records and incident reports of patients with communication disability following stroke reveal that hospital staff recognize the impact of communication disability as potential risk factors for falls for this group. It was difficult for staff to report the circumstances of the fall for patients with severe communication disability. Despite the recognition

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of communication as a potential contributing factor, few medical record entries documented strategies related to communication interventions to improve patients' ability to understand instructions, gain attention or communicate basic needs.

KEYWORDS

communication disability, falls, falls research, inpatient, patient safety, stroke

WHAT THIS PAPER ADDS

What is already known on the subject

- People with stroke are at a high risk of falls during their hospital admission. However, little is known about the circumstances of their falls and the influence of communication disability on these falls.

What this paper adds to existing knowledge

- Patients with communication disability have unique factors that contribute to their falls in the hospital. Patients were described as experiencing a fall when taking a risk or attempting to address an unmet need, and these falls were often related to a patient's difficulties communicating their basic needs, gaining attention from staff, and following simple instructions.

What are the potential or actual clinical implications of this work?

- Communication disability as a risk factor for a fall, and fall prevention strategies tailored to the communication disability, were typically identified and documented by physiotherapists, occupational therapists and nursing staff. The inclusion of speech pathologists in fall risk assessment, management, and prevention strategies may provide crucial information regarding the patient's communication disability that may enhance their fall prevention plan.

INTRODUCTION

Falls in hospital impose a high-cost impact on health services and patients; including injury, loss of functional capacity and increased length of hospital stay (Batchelor et al., 2012; Hill et al., 2007; Morello et al., 2015). People with stroke are at a high risk of falls, with between 14% and 65% of patients falling at least once during their hospital admission (Batchelor et al., 2012; Walsh et al., 2016). Risk factors for falls in patients with stroke include balance impairments, difficulties with self-care and activities of daily living, and neglect (Campbell & Matthews, 2010; Denissen et al., 2019)).

Communication disability, specifically related to aphasia, dysarthria, apraxia of speech, and cognitive communication difficulties, affects an estimated 64% of people with

stroke (Mitchell et al., 2020, O'Halloran et al., 2009) and can lead to barriers to their effective communication with hospital staff (O'Halloran et al., 2012; Simmons-Mackie & Kagan, 2007; Sullivan et al., 2020, 2023) and adverse events in hospital (Hemsley et al., 2013). People with communication disability following a stroke are three times more likely to experience adverse events, including falls, during their hospital admission (Bartlett et al., 2008) when compared with people without communication disability. However, there is limited research evaluating strategies suggested to improve patient safety for those with communication disability in hospitals (Hemsley & Balandin, 2014). Indeed, patients with communication disability are often excluded from falls research because of their communication impairments (Hemsley et al., 2019). Although a recent systematic review and meta-analysis did not find an

association between communication disability and falls, the findings of the review were limited by the majority of the 15 included studies either excluding participants with severe communication disability or not reporting on the severity of participants' communication disability (Sullivan et al., 2020). Associations between communication disability were reported in four of the studies which also specified the inclusion of patients with severe communication disability. A secondary analysis of the same studies indicated that there was little information in research to date regarding the circumstances and contributing factors to falls in hospital for people with communication disability following stroke (Sullivan et al., 2021).

The reports of patients with communication disability following stroke and their family members suggest that this group may have unique factors that contribute to falls in the hospital, including difficulties gaining attention through the call ball system, and communicating their needs to staff (e.g., the need for the toilet, hunger, pain) (Hemsley et al., 2013; Sullivan & Harding, 2019). Furthermore, people with communication disability reportedly have difficulties following instructions, such as those required to transfer from a bed to a chair, which in some circumstances has resulted in a fall (Sullivan et al., 2020; Zdobysz et al., 2005). The combination of these communication difficulties may result in people engaging in risk-taking behaviours such as attempting to walk to the toilet alone to meet their own needs (Sze et al., 2001).

A recent study examining the medical records and incident reports relating to the context and circumstances of falls in patients with communication disability after stroke, over an 8-year period, found that a substantial number of falls were unwitnessed falls or rolls from the bed (Sullivan et al., 2023). Patients typically found on the floor by staff also had equipment such as floor line beds and bed and/or chair alarms used in an effort to prevent the falls and protect the patient from injury (Sullivan et al., 2023). Furthermore, many falls had reportedly occurred with unknown contributing factors, as the severity of the person's communication disability meant they were unable to recount the details of the fall. Nonetheless, where circumstances of the fall could be reported, the falls were largely attributed to patient factors, such as balance impairments, weakness, and neglect (Sullivan et al., 2023).

The insights of hospital staff documenting the falls in medical records and incident reports may further assist in identifying ways to reduce the risk and incidence of falls in this vulnerable population. Knowing more about the circumstances and contributing factors for falls in people with communication disability following stroke may provide further insights into the impact of communication disability on falls and on falls-prevention strategies.

The written accounts of hospital staff at the time of a fall, required in the medical records and incident reports, could reveal more about the influence of communication disability on falls. This documentation may also provide insights into the ways that staff respond to these incidents, including any follow-up strategies in relation to communication. Therefore, the aim of this study was to examine the written texts contained in hospital medical records and incident reports on falls, for content relating to communication disability and communication strategies; to contribute to an in-depth understanding of ways to further understand and manage falls risk and prevention strategies for this vulnerable group.

METHOD

A medical record and incident report review with content thematic analysis with both deductive and inductive coding (Elo & Kyngäs 2008; Lyons et al., 2022) was conducted for patients admitted to stroke rehabilitation wards over an 8-year period (2013–21) who also had a documented communication disability following stroke. Ethical approval for this study was obtained from the health service human research ethics committee and the universities involved. In this paper, the term 'participants' is used to refer to the specific patients whose data were included in this research, and the term 'patients' is used when referring to the patient population more broadly.

The methods of this medical record review of progress notes and incident reports have been described in detail previously in a paper outlining the types of falls, perceived contributing factors and circumstances, and risk management strategies (Sullivan et al., 2023). The prior study took a quantitative, categorical approach to describing falls in patients with communication disability including the perceived contributing factors for falls, the circumstances of a fall, and falls prevention strategies. The results of that research suggested that communication disability was one perceived contributing factor to falls for this patient group (Sullivan et al., 2023). The present study approaches the data with a complementary qualitative interpretation of the data, to understand more about the nature of the falls, and ways that communication disability is framed and positioned by hospital staff in their written accounts of what happened and what followed a fall.

Context

Participants were enrolled from two 32-bed subacute rehabilitation wards at a major metropolitan health network in

Australia. Each subacute ward is a 32-bed facility offering both neurological and orthopaedic rehabilitation under the care of a medical rehabilitation consultant and multidisciplinary allied health and nursing team. Patients with stroke participate in a patient-specific, goal-directed intensive rehabilitation programme with a similar model of care provided across both wards. Patients are placed in either single or shared rooms (up to four beds per room) and attend therapy sessions in dedicated spaces (e.g., a gymnasium, patient kitchen area) and in their bedrooms. Each patient is provided with a call bell, placed within reach, including consideration of any physical difficulties accessing the call bell due (e.g., hemiplegia, hemianopia). Where patients are unable to use the call bell, they may be offered alternatives such as a doorbell chime or hand-held call-bell if appropriate (i.e., if the patient is able to use these to attract attention). Additionally, when in their rooms, patients are meant to have their mobility aid, a drink, and other personal items within their reach as standard falls prevention strategies.

In the organization providing access to the data, patients who are admitted to subacute rehabilitation with communication disability following stroke are assessed by a speech pathologist and provided with individualized, goal-directed, evidence-based therapeutic interventions. Intervention may be delivered individually, in groups, or in conjunction with other therapists (e.g., physiotherapists). Where appropriate, patients are provided with augmentative and alternative communication aids or visual supports to assist with the communication of needs and wants.

Sampling strategy and inclusion criteria

The health service provided a spreadsheet of the medical record numbers of all patients admitted with stroke to the subacute wards between July 2013 and June 2020, with each admission forming an episode of care. Additionally, all patients with stroke admitted between 1 September 2020 and 31 August 2021 were prospectively followed through their admission using a patient management system and screened against the inclusion criteria. The first author sorted each episode of care chronologically and matched the medical record number to eligible patients.

Patients were eligible for inclusion if: (1) they were admitted to one of the subacute wards following a left hemisphere stroke; (2) had a *new* associated communication disability following stroke, as diagnosed by a speech pathologist; (3) had a documented fall or near miss fall during their subacute rehabilitation admission; and (4) their medical records and incident reports included comments relating to communication disability

that would provide further insights into hospital falls of patients with communication disability following stroke (Table 1).

Data collection methods

The medical records accessed via the electronic medical record and fall incident reports for included participants were obtained in full from the organization. Medical records and incident reports were de-identified after being matched to the participants and their falls. An Excel database was created and included data for each participant on: (1) demographics, (2) length of stay in subacute rehabilitation and (3) total admission functional independence measure (FIM) score. Further, all entries from these two data sources for each participant were transcribed verbatim into a bespoke Word document in relation to: (1) speech pathology notes regarding the type and severity of communication disability, including assessment tools used for diagnosis; (2) entries from the multidisciplinary team (e.g., nurses, speech pathologist, medical doctors and physiotherapists) pertaining to communication disability during the 24 h before and 72 h following the fall or near miss fall; and (3) circumstances surrounding the fall (e.g., activity during the fall, medical assessment following a fall).

Data analysis

The Generic Reference Model (Runciman et al., 2006) is a patient safety framework used to guide the collection and classification of information about a patient safety incident according to three key stages of the incident: (1) the contributing factors to the incident, (2) the incident, and (3) the outcomes of the incident for the patient and the organization. As the model does not include an assessment of risk factors that lead to a patient safety incident, identified risk factors were coded separately. The relevant aspects of the model are outlined in Table 2 with examples. The data were initially coded according to the factors within the Generic Reference Model (Runciman et al., 2006). A content thematic analysis of the data was then completed (Elo & Kyngäs 2008; Lyons et al., 2022) using data from any documents that included communication disability. This involved: (1) reading and re-reading the extracted data; (2) applying codes to unique categories of meaning within the data; (3) generating themes in a constant comparison manner as participants' data came into the study; and (4) developing, refining and verifying themes connecting categories within and across the data.

TABLE 1 Inclusion and exclusion criteria

Inclusion criteria	Definition	Exclusion criteria
Left hemisphere stroke	Confirmed through the results of a reported computed tomographic (CT) scan or magnetic resonance imaging (MRI)	Patients with right hemisphere stroke, a suspected stroke that was not confirmed by imaging, or with bilateral hemisphere or intraventricular stroke, were excluded
New communication disability	Diagnosed by a speech pathologist for the stroke admission following an informal or formal assessment of communication skills	Patients with significant cognitive impairments impacting on communication (e.g., dementia); and those with a pre-existing communication disability (e.g., related to a prior stroke) were excluded
Falls	'An event which results in a person coming to rest inadvertently on the ground, floor or other lower level'	
Near miss falls	'An error that has the potential to cause an adverse event [patient harm] but fails to do so because of chance or because it is intercepted'	
Comments relating to communication disability	Documentation in the 24 h before or 72 h following a fall from either the medical record or the incident report included reference to the patient's communication disability in relation to the fall or near miss fall	Patients whose medical records did not include reference to communication disability in relation to a fall or near miss fall, in the 24 h before or 72 h following a fall or near miss fall, were excluded

TABLE 2 Generic reference model (Runciman et al., 2006)

Stage of incident	Example
Contributing factors and hazards	
Environmental factors	Lighting, floor surface, ward clutter
Organizational factors	Staffing levels, falls prevention policies
Human factors	Inappropriate assistance by staff/family
Patient factors	Balance impairments, dependence for activities of daily living, communication disability
Medication, equipment, documentation	Medications, failure of equipment, error or conflicting documentation, e.g., about a transfer
The incident	
Timing of incident	Time of day of the incident
Method of detection	Found on the floor, witnessed fall, unwitnessed fall
Outcomes and consequences for the patient	
Injury	Sprain, skin tear, fracture
Suffering	Fear of falling, mood changes, delay/change in therapy, further medical investigations
Outcomes and consequences for the organization	
Subsequent or planned action	Additional investigations, hiring of equipment
Resource impact	Bed changes, additional observations, additional staffing

Researcher interpretation and verification steps to increase rigour

All members of the research team had experience working in clinical settings with patients with stroke. The first author and coder is a speech pathologist with extensive

experience working with patients with communication disability following stroke and knowledge of the context of the metropolitan health network as an employee. The third author is an occupational therapist employed by the metropolitan health network in a non-clinical role. Any pre-existing views held by these authors about the

content of written texts in relation to communication disability and falls (through their employment with the organization or professional bias) were acknowledged and managed through the data collection and analysis. This included all authors discussing, over several iterations of coding of categories and arrival at the content themes, a range of alternative explanations from a variety of interdisciplinary viewpoints (the second author is a speech pathologist and the final author is a physiotherapist). The verification of themes and relationships within the data was discussed by the authors who all had access to the transcribed raw data. The accuracy of data extraction was confirmed by two research research assistants not involved with data collection as an external step increasing rigour, increasing credibility and trustworthiness of the findings (Elo & Kyngäs 2008).

To further increase the verifiability and plausibility of the researcher's interpretations in relation to the text-based data, quotes and excerpts are used to illustrate the themes and support the findings. These are labelled according to the participant (patient who fell) and the corresponding entry in the medical record or incident report; as in P1MR refers to a participant 1 medical record entry, and P1IR refers to a participant 1 incident report entry. As described above, as these participants are a subset of a prior study, (Sullivan et al., 2023), the participant numbering is non-sequential. The use of a patient safety framework to guide the data collection and synthesis as well as using a constant comparison method to develop the themes provided a theoretically sound method of synthesizing findings (Walshe & Boaden, 2006).

RESULTS

Participants

A total of 1962 episodes of care were screened against the eligibility criteria. In total, there were 72 participants with documentation relating to 265 falls included in the research (Figure 1). The mean age of the participants was 73.5 years (SD = 11.1, range = 41–94 years) with 44 men (61.1%) and an average length of stay in the rehabilitation ward of 35.3 days. More than two-thirds of participants (69.4%) were diagnosed with a severe or profound communication disability and the most common diagnosis was an expressive and receptive aphasia (33%) or aphasia co-occurring with apraxia of speech (26.4%). In addition to their communication disability, the majority of participants were incontinent, unable to mobilize, and required full assistance for their activities of daily living. Further participant details are outlined in Table 3 and Table S1 in the additional supporting information.

Participants' communication disability

Communication disability in this population included aphasia, dysarthria, apraxia of speech or cognitive communication disability, or combinations of these. Communication disability was diagnosed by a speech pathologist using a combination of standardized assessment tools and functional communication assessment. Documentation of participants' communication disability by speech pathologists typically included comments or assessment at the impairment level of (1) receptive language skills, (2) expressive language skills, (3) motor speech, (4) a diagnostic statement, and (5) strategies for staff to support communication in their interactions with participants. In some documentation, the speech pathologist documented their clinical opinion on if the patient could communicate their basic needs or not and a statement regarding risks of adverse events in hospital. Examples of clinician documentation can be found in Table S2 in the additional supporting information. In 49 participants, speech pathologists used one of the following standardized assessment tools to assess the communication disability: (1) Western Aphasia Battery (Kertesz, 2007), (2) Comprehensive Aphasia Test (Swinburn et al., 2004), (3) Frenchay Dysarthria Assessment (Enderby & Palmer, 2008), (4) Cognitive Linguistic Quick Test (Helm-Estabrooks, 2001), and (5) Mt Wilga High-Level Language Assessment (Christie et al., 1986). On admission to rehabilitation, four participants had a mild communication disability, 15 had a moderate communication disability, 47 had a severe communication, and three had a profound communication disability as diagnosed by a speech pathologist. In three participant records, a speech pathologist had provided a diagnostic statement following an assessment, however, the statement did not include a measure of severity.

Authors of the documents

Documentation in the medical record or incident reports regarding communication disability surrounding a fall was made by nurses, physiotherapists, medical doctors, speech pathologists, and occupational therapists.

Content thematic analysis

The content themes are presented in a sequential order supported in the Generic Reference Model of Patient Safety (Runciman et al., 2006) and reflecting the patient journey relating to: (1) risk factors leading up to the falls, (2) falls prevention strategies implemented, (3) contributing

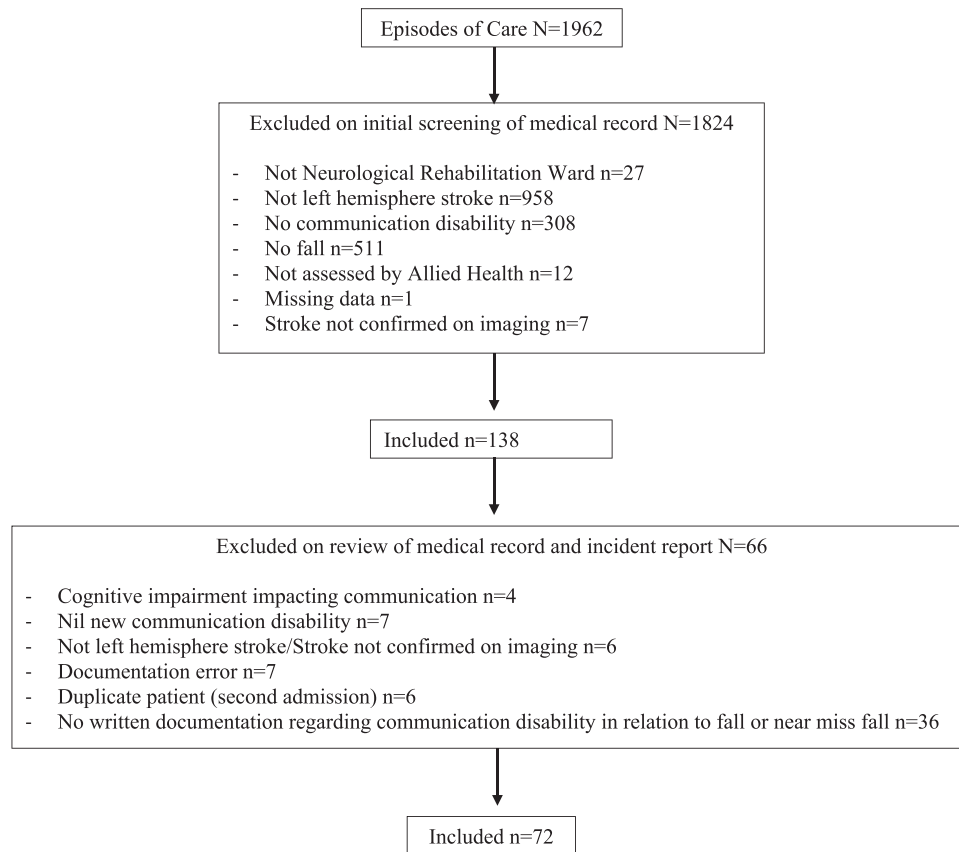


FIGURE 1 Case identification flowchart

TABLE 3 Participant characteristics by severity of communication disability

	Mild	Moderate	Severe	Profound	Missing severity data	Total
<i>n</i>	4	15	47	3	3	72
Age (years)	74.6	73.5	73.9	74.7	69.2	73.5
[mean (SD; range)]	(9.9; 45–80)	(11.1; 41–94)	(11.1; 41–94)	(13.3; 62–90)	(10.8; 76–85)	(11.1; 41–94)
Gender	2	11	28	2	1	44
[<i>n</i> (% male)]	(50)	(73.3)	(59.8)	(66.7)	(33.3)	(61.1)
LOS	47.5	48.0	46.5	39.1	62.3	35.3
[(mean days, (SD; range)]	(28.6; 51–58)	(31.0; 30–159)	(28.4; 3–161)	(25.2; 21–86)	(41.6; 27–48)	(30.9; 3–161)
Total FIM	33.5	34.6	34.6	34.9	41.4	34.8
[mean (SD; range)]	(17.9; 18–77)	(17.8; 20–60)	(17.6; 18–86)	(23.6; 18–20)	(12.9; 18–46)	(17.8; 18–86)
Falls per participant	2.7	3.7	3.8	7.3	1.3	3.7
[mean (SD; range)]	(1.7; 1–3)	(5.3; 1–5)	(5.4; 1–40)	(11.3; 1–11)	(0.5; 1–2)	(5.3; 1–40)

Note: FIM, admission functional independence measure. LOS: length of stay in hospital.

factors for a fall, (4) the fall incidents as described in the documents, and (5) outcomes of the falls. The presentation of themes is supported by matched verbatim quotes extracted from either the medical record (MR) or incident report (IR) and Figure 2 describes how these themes are related to one another.

Risk factors for a fall

Difficulties following instructions

In 10 of the 72 participants (13.9%), staff documentation included reference to the participant's communication

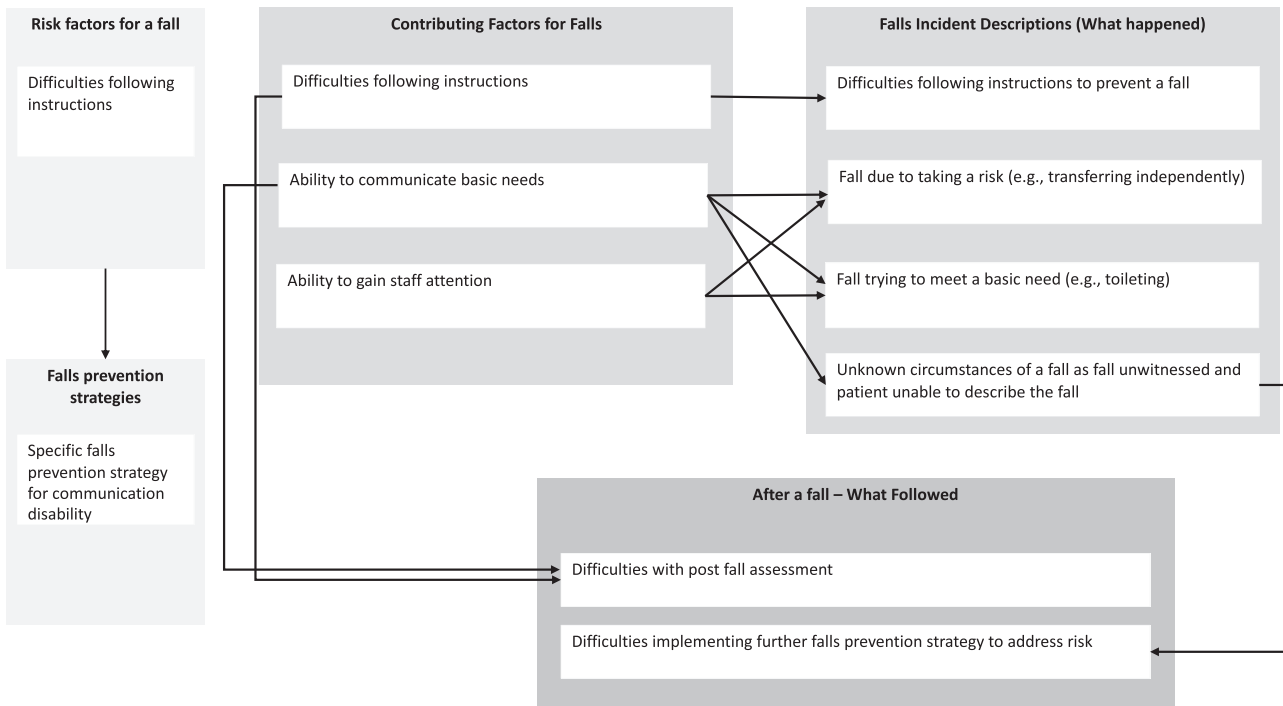


FIGURE 2 Communication disability factors appearing in the medical records and incident reports of falls in participants with communication disability following stroke

disability placing them at risk of a fall; specifically in relation to the patient having difficulty following instructions, and often in conjunction with a physical impairment, as P16MR wrote, '[patient] has significantly decreased sitting balance and is inconsistent following commands—significant falls risk'.

Impaired receptive language

The documents also revealed other elements of impaired receptive language potentially impacting on falls risk, documented by staff in the medical record during the 24-h period before or in the 72 h following a fall. Participants were described in the notes as requiring prompting, or being unable to follow specific prompting, such as '[transfers] very poorly does not respond to 1 step commands, for hoist [transfer] now' (P42MR). Participants were also described as being 'disorganized' or 'incoherent' or as having difficulties responding to 'redirection' and following safety instructions as in 'Patient needs close supervision as patient appears to be incoherent ... needs prompting and direction' (P21MR).

Specific falls prevention strategies for communication disability

Communication strategies for staff

Strategies to mitigate the risk of falls related to communication disability were described in 10 (or 13.9%) of the participants included in the sample. These risk mitigation strategies related to adaptations staff needed to make when communicating with participants during functional tasks such as transfers '[patient] requires clear step by step instructions [during transfers]' (P95MR) and were provided by physiotherapists or occupational therapists. Following their communication assessment, speech pathologists commonly recommended strategies such as 'use short simple sentences' (P12MR) for staff to use in all care activities and interactions.

In one case, falls prevention education was delivered to a participant by the occupational therapist using adapted communication strategies. In this case, the participant had mild receptive and expressive aphasia. Supervision while using a wheelchair had been recommended, and the patient had subsequently experienced a fall from a



wheelchair. The written data reflected that information about the participant's need for supervision was conveyed verbally to the participant, who became frustrated with this recommendation. The occupational therapist made the following entry in the medical record, suggesting that they subsequently provided education adapted to the participant's communication needs:

Pt [patient] became increasingly frustrated this past week at OT's [occupational therapist's] recommendation for supervision with mobilising in power wheelchair. Upon d/w [discussion with] SP [speech pathologist] it was found that patient was unaware why [redacted] was requiring supervision and also SP have found [patient's] reading comprehension more effective than auditory. Consequently, OT clearly outlined in writing for [patient] that he needed to work on [functional skills] if [patient] has had no accidents, he can be made independent on the ward.(P1MR)

Contributing factors for falls

In addition to difficulties following instructions in activities of daily living and therapeutic tasks, two further themes were identified as contributing factors for falls: (1) the patient's ability to gain attention by using the call bell, calling, or shouting out, or other behaviour; and (2) the patient's ability to communicate their basic needs such as the need to use the toilet, hunger or pain.

Ability to gain staff attention

In total, the medical records and incident reports described 24 (33.3%) participants as being able to gain attention and the method used to do so (e.g., using the call bell or shouting/calling out). Most reports of the ability and manner of gaining attention was documented by nursing staff in relation to a functional task, as in: 'Presses buzzer for assistance with urinal' (P49MR). Nursing staff also identified other behaviours participants used to gain attention and assistance, such as calling out, shouting for help, or idiosyncratic methods such as becoming restless or agitated thus activating the bed and/or chair alarm alerting staff, as in the following quote: 'Patient initiates toileting by fidgeting' (P22MR).

There were 11 participants whom hospital staff had documented as not having a way to gain attention or assistance, for example: 'Difficult to communicate with

patient, does not initiate any care needs' (P18MR). In total, the 11 participants described in the medical records or incident reports as being unable to gain attention through any method experienced 65 (24.5%) of the total falls.

Ability to communicate basic needs

At the time of documenting admission, 21 (29.2%) of participants were described in the document data (either by speech pathologists during assessment or by nursing staff during functional tasks) as not being able to communicate their basic needs on the ward through any method (i.e., verbally, gesture, augmentative or alternative communication, or picture boards), and 18 (25%) were described as able to communicate their basic needs. For the remainder ($n = 51$), their ability to communicate basic needs was not documented. Some participants were reportedly able to attract attention but unable to communicate their basic needs, as in the following quote from the medical record:

[patient] buzzing frequently ... mostly unable to say what he wanted ... became quite agitated when staff went to leave' (P2MR).

Where a participant's ability to communicate their basic needs was not documented explicitly by staff, some of this information was described briefly or indirectly in the speech pathology medical record entries as in

'... communication largely non functional'.
(P4MR)

Participants who were unable to communicate their basic needs were often described in the medical record by nursing staff as being unable to communicate effectively, as in 'Patient unable to verbalise needs' (P21MR); or as having non-functional communication by speech pathologists, as in 'Communication remains non-functional and unreliable at a basic level' (P27MR). Other descriptions reflected that staff viewed the participant as being 'non-verbal', 'alert and vague' or found it 'difficult to communicate' with the patient. The 21 participants who were unable to communicate their basic needs experienced 147 (55.5%) falls, accounting for more than half of the falls in the sample.

Falls incidents

Of the 265 falls experienced by the 72 participants, 194 (73.7%) occurred when: (1) the participant was

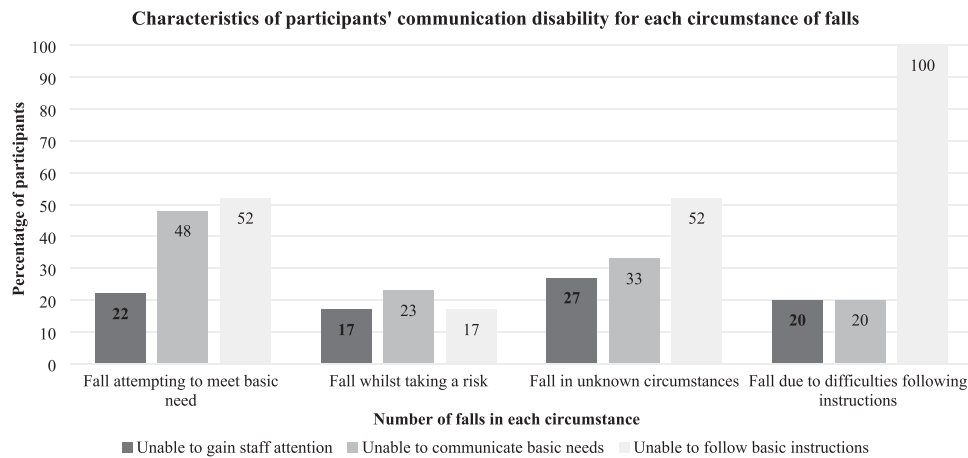


FIGURE 3 Characteristics of participants' communication disability for each circumstance of fall

attempting to address an unmet need (e.g., attempting to mobilize independently to get to the toilet) ($n = 42$); (2) the participant was taking a risk (e.g., transferring from the bed to the chair independently) ($n = 50$); (3) circumstances were unknown due to the severity of the participant's communication disability preventing their ability to describe what had happened (e.g., participants were found on the floor with an unknown reason for their fall) ($n = 97$); and (4) staff had reported that the participant had difficulties following instructions ($n = 5$). In total, 27 participants experienced at least one fall in the circumstances of engaging in a behaviour to address an unmet need; 35 participants experienced at least one fall when taking a risk; 31 participants experienced at least one fall in unknown circumstances due to the severity of the participant's communication disability preventing their ability to describe what had happened; and five participants experienced at least one fall when having difficulties following instructions from staff. The characteristics of the participants' communication disability for each circumstance of falls are outlined in Figure 3.

Fall when the patient is attempting to meet a basic need

Where unmet needs were described as contributing to falls ($n = 42$), these were most often related to toileting ($n = 38$, or 90.5%). In medical records about these falls, nursing staff commonly described participants as being found after a fall needing their personal hygiene attended to, for example: 'Rolled off bed after being faecally incontinent' (P78IR). Staff also documented participants falling whilst attempting to get to the toilet, as in 'Patient found sitting on the floor on his bottom attempting to scoot to the toilet' (P71MR) or participants being found on the floor, as

in the following incident report: 'found patient on the floor ... incontinent of both' (P24IR).

Fall when the patient is taking a risk

Documentation about falls when participants taking risks reflected that hospital staff viewed these falls as the responsibility of the participant, as in this note by a medical doctor: 'patient had an unwitnessed fall while tried to mobilise on own with 4WF [four wheeled frame] without calling for RN [registered nurse] help' (P67MR); and in this medical record entry from a nurse describing the circumstances of the fall 'without any discussion, patient lifted himself from armchair and attempted to walk to wheelchair' (P13IR). The majority of falls attributed to the patient taking undue risks occurred during a transfer (e.g., moving from a chair to a bed) and hospital staff described these patients negatively as 'impulsive' and 'non-compliant' as illustrated in the following note written by a nurse 'rang bell for nursing staff but failed to wait for attention' (P60MR).

The medical record also revealed that staff viewed participants as being either frustrated with their progress in their rehabilitation or pleased with improvements in their physical function; and in both circumstances testing their skills (i.e., taking a risk) which resulted in a fall. The incident report by the health professional investigating a fall experienced by participant 13 when testing their skills: 'Patient is aware that he needs assistance to stand but he has been making improvements and wanted to see if he could stand unassisted' (P13IR). Further, when discussing a fall experienced by participant 86 the medical doctor reported 'Unsafe, unsupervised transfer into bed from chair, striking head on bedside table ... Pt [patient] says she got up too quickly/frustrated by slow progress'



(P86MR). Often after noting risk taking behaviours in participants, nursing staff in particular described in their medical record entries reminders to the participants to use the call bell to seek assistance, as in 'Patient tried to stand up on his own to go to bed. Stopped and assisted by nursing staff at once. Reminded pt [patient] to ring bell for assistance' (P52MR).

Unknown circumstances of a fall as fall unwitnessed and patient unable to describe the fall

Of the participants who experienced an unwitnessed fall or were unable to describe the fall, one had mild communication disability and did not speak English and an interpreter was not used to investigate the fall; and another had moderate communication disability and impaired short-term memory impacting on their recall of the fall. Participants were described as being unable to report on a fall or what they were attempting to do in the lead up to the fall, as noted by the health professional investigating the fall in the incident report: 'unable to ascertain event leading to fall as patient is dysphasic' (P41R) and 'Poor historian? expressive dysphasia ... pt [patient] unsure why she fell' (P68MR). Commonly, these participants were found on the floor following their fall by staff during intentional rounding, cleaning or walking past the room. Documentation from staff surrounding these falls describes participants as 'poor' or 'vague' historians.

Difficulties following instructions to prevent a fall

All five participants who experienced a fall when having difficulties following instructions experienced other falls when attempting to meet a basic need, taking a risk, or with unknown circumstances. In all except one of those falls, participants were described as being unable to follow an instruction from staff to prevent the fall, as illustrated in the following quote from the incident report: 'Due to ... language barriers making it difficult to communicate with patient staff witnessing the fall had difficulty preventing patient from reaching forward' (P31MR). Another participant had difficulties following an instruction during a task, as outlined by a medical doctor reviewing the patient: 'Patient had a witnessed fall whilst [transferring] from chair to bed ... patient not following a [transfer] instruction' (P68MR). In the remaining fall, the participant had difficulties following an instruction during a therapeutic task with the physiotherapist which resulted in a fall as noted in this description of the fall: 'Patient recep-

tively and expressively dysphasic. Patient misinterpreted therapist instruction and attempted to sit down. Chair too far away. Knee control and therapist strength unable to assist patient to return to standing. Patient gently lowered to floor' (P191R).

Outcomes after falls

The vast majority of falls resulted in a physical assessment by a medical doctor, observations by nursing staff for a period of time and an investigation of contributing factors to the fall by the treating team (including nursing, allied health and medical doctors).

Difficulties with post fall assessment

Medical doctors reported participants with communication disability were difficult to examine, especially those with severe communication disability who were unable to follow instructions or communicate their basic needs. Changes to the participants' neurological status (e.g., orientation, cranial nerve assessment) following a fall were reportedly difficult to assess as illustrated in this entry by a nurse: 'Neuro[logical] obs[ervations] unobtainable ... as patient unable to follow instructions' (P65MR). A physical examination for superficial marks or redness on the participant's body was used often to indicate the impact point of the fall where patients were unable to describe the fall as in; 'poor recall of the event ... mark on forehead would indicate head-strike' (P67MR) and potential injury was supported by observation of facial expressions and behaviour as illustrated by a nurse: 'Pt [patient] massaging [right] side of temple as if to indicate pain/attempt to relieve pain' (P74MR). Assessment of participants for injury following a fall became more challenging when the participant was not known to the medical doctor performing the examination, or their fall occurred shortly after admission meaning staff were unfamiliar with the participant and unable to determine behaviour changes as a medical doctor reported in the notes 'difficult assessment due to inattention, difficulty following complex instructions and no prior knowledge of pt [patient]' (P68MR).

The treating team's investigation of the circumstances leading to a fall in participants with communication disability was challenging, particularly in falls experienced by participants with severe communication disability. Documentation from staff who either discovered the participant had fallen or were investigating the fall indicated that staff were unable to determine the circumstances, as in: 'Pt [patient] found on floor by nurse. Unable to get history due to aphasia' (P95MR) and 'Patient aphasic after stroke so

difficult to establish why patient moved forward so suddenly' (P79IR). At times, staff speculated on an activity the participant may have been trying to achieve when documenting the fall in the medical record or investigating the fall, for example: 'Appears to have been collecting clothes from the wardrobe and lost her balance' (P74IR) or 'Pt [patient] had unwitnessed fall, seemingly trying to get up to go to toilet' (P64IR).

Difficulties implementing further falls prevention strategies to address risk

Nearly half of participants (45.8%) experienced multiple falls, 13 participants experienced multiple falls in unknown circumstances, 10 participants experienced multiple falls attempting to address a need, and 10 participants experienced multiple falls taking a risk.

There were 22 participants who experienced falls across more than one of the four factors. Documentation for these participants revealed that there were difficulties implementing further strategies to prevent falls and staff investigating incidents described patients as having 'numerous' or 'multiple' falls and that all fall prevention strategies are currently in place as illustrated in an incident report:

This is an ongoing problem with the patient rolling from the bed almost daily. All falls prevention strategies in place: floor line bed, crash mats, rounding, high visibility room, bed alarm, toileting plan and family sitting with the patient whenever their schedule allows. Patient has communication and cognitive impairment so is not able to call for assistance when she needs to use the toilet and toileting plan is not capturing all episodes of her need to use the toilet.(P56IR)

Participants who experienced multiple falls were often described in the documentation as 'restless', 'agitated', 'confused' and 'lacking insight' as described by a nurse: 'Pt alert and confused +++ ... Pt [patient] became very agitated at 1700 hours. Continually trying to get out of bed. Throwing his legs over [the] side' (P79MR).

Further, for some participants who experienced multiple falls the staff entries following a fall revealed a shift in focus from preventing a fall from occurring to minimizing the harm from a fall. This is described in an incident by a staff member investigating a fall 'All strategies in place to optimize his safety' (P31IR). These instances were often documented as being discussed with the participants' family 'Family aware of ongoing strategies to reduce harm' (P56IR).

DISCUSSION

This study examined the content of medical records and incident reports on patients with communication disability after a stroke who had experienced a fall. The use of medical record review including patient medical records and adverse event incident reports yielded a relatively large number of falls for a population often excluded from falls research (Hemsley et al. (2019). The findings provide several insights into the ways that hospital staff frame falls risk and prevention strategies for patients with communication disability following stroke and also provide important detail on the falls of patients with communication disability following stroke, according to the Generic Reference Model of patient safety (Runciman et al., 2006).

Previous research has suggested that patients in hospital fall for several reasons including (1) changes to physical function, (2) limited awareness of their physical limitations, (3) a sense of urgency regarding personal care, and (4) a desire to test their skills (Aihara et al., 2021; Haines et al., 2015; Hanger et al., 2014; Weerdesteijn et al., 2008). The reasons for patients experiencing falls in this study are similar. However, the presence of a communication disability in patients following stroke adds additional complexity. The functional implications of a patient's communication disability may mean patients have difficulty understanding the changes to their physical function and their physical limitations due to difficulties with comprehension; and when there is a sense of urgency regarding their personal care there are difficulties attracting the attention of staff and communicating that need. As a result, patients are taking risks that not only lead to a fall, but in the case of personal care, are also experiencing the indignity of soiled clothing or an episode of incontinence (Kitson et al., 2013; Mangset et al., 2008).

Hospital staff considering and documenting other aspects of receptive language impairments (e.g., difficulties following instructions) potentially contributing to falls risk supports prior research identifying a potential link between communication disability and falls risk (Sinanovic et al., 2012; Sullivan & Harding, 2019; Sze et al., 2001). Further, the finding that patients who were unable to communicate their basic needs experienced more than half of the total number of falls supports previous research indicating that patients with severe communication difficulties and low FIM expression scores, specifically a score of less than 4, maybe a risk factor for falls (Salamon et al., 2012; Sullivan & Harding, 2019; Sze et al., 2001). The documents reflected that where patients were unable to attract attention through the call bell or shouting, staff were occasionally able to recognize patterns of behaviour in patients when they needed the toilet; such as fidgeting or becoming restless. Often these behaviours resulted in the bed and/or



chair alarm being activated and thus alerting staff that the patient required assistance. Whilst the use of bed and/or chair alarms for falls prevention have limited effect (Morris et al., 2022), it appears in some instances the bed and/or chair alarm inadvertently provided a way for patients with communication disability to gain the attention of staff to address a need. Whilst the bed and/or chair alarm may provide a useful strategy for patients with communication disability to gain the attention of staff, other methods should also be explored such as single use call bells, door bells, and hand held chimes.

The finding of patients experiencing a fall whilst attempting to address an unmet need is novel. This understanding of the circumstances of falls and the actions of the patient before the fall goes some way to explaining the high falls rates from bed experienced by patients with stroke and communication disability found in Sullivan et al. (2023). However, the findings also reflect that there may be a substantial group of patients with unknown circumstances due to the fall being unwitnessed and the patient being unable to describe the fall. This may mean that it is always going to be difficult to fully determine the causal factors of falls in patients with communication disability, short of surveillance monitoring of these patients when alone.

The documents reflected that staff wrote about patients' communication disability in the time periods before and after a fall, however the aspects of communication disability discussed were not commonly considered in relation to falls risk, falls prevention and as a contributing factor to falls, in particular patients who experience multiple falls. Steel et al. (2019) found that speech pathologists typically used more diagnostic terms to describe communication disability and key information on communication diagnosis or function was not always documented. This study had similar findings to Steel et al. with the descriptions of communication disability provided by speech pathologists aimed at the diagnostic or impairment level and not designed to provide information about the function of communication or how to respond with strategies to help support understanding or expression in everyday care tasks. Additionally, there were few entries containing specific recommendations from speech pathologists for communication in relation to falls risk. The inconsistent documentation of the functional implications of communication disability may have impacts on staff identifying the role of communication disability in falls. The findings provide some evidence of some staff reportedly making specific adaptations to their communication strategies in response to falls, presumably to reduce the patient's risk of falling. However, the lack of consistent and specific recommendations from speech pathologists may mean staff have difficulties communicating effectively with patients in relation falls risk, falls prevention education, under-

standing the circumstances of a fall, and assessing patients for injury following a fall. Changes to assessment and documentation practices for speech pathologists, such as the increased focus on function and documenting communication strategies for nurses, may go some way to addressing these issues. An increased focus on communicative function and the patient's ability to communicate healthcare needs is also in line with the Australian Aphasia Rehabilitation Pathway (Clinical Centre for Research Excellence in Aphasia Rehabilitation, 2014) and may help the patient and staff to optimize communication to reduce falls risk.

Hospital staff documenting that despite multiple falls prevention strategies being in place (e.g., bed and/or chair alarms, floor line beds) many patients continued to experience falls highlights the difficulties of implementing falls prevention strategies in this population. It appears that the presence of significant physical impairments and added complexity of severe communication disability in these patients made it difficult for staff to implement tailored falls prevention strategies. In this study, communication disability as a risk factor for a fall along with falls prevention strategies were typically identified and managed by physiotherapists, occupational therapists and nursing staff rather than speech pathologists, suggesting that the role of speech pathologists in falls management in this health service was limited. Speech pathologists have expertise in working with patients with communication disability and the inclusion of speech pathologists in falls risk assessment, management, and prevention strategies may provide crucial information regarding the patient's communication disability that may enhance the patient's fall prevention plan. As part of an inter-professional approach, in that all healthcare providers have a role in improving communication, the expanded roles of a speech pathologist may include (1) providing staff with explicit communication strategies to facilitate care (e.g., specific instructions for transfers) (Carragher et al., 2021; Hemsley et al., 2013; Sullivan et al., 2020); (2) providing therapeutic interventions specific to the communication skills of the patient in hospital (e.g., communicating basic needs, gaining attention) (Hemsley et al., 2013; Sullivan et al., 2020); (3) providing adapted falls prevention education suitable for the communication skills of the patient, in a communicatively accessible environment (Briffa, et al., 2022; Hemsley et al., 2013; Stans et al., 2017; Sullivan et al., 2020, 2021); (4) providing alternatives to the call bell; and (5) improving the patient's ability to understand instructions which may include providing therapeutic interventions in conjunction with physiotherapists for example to support communication during transfer training, providing an opportunity for ongoing training to health professionals to communicate with patients with communication disability (Carragher et al., 2021). Speech pathologists could potentially

expand their roles in supporting patients to communicate the circumstances of any falls after the fact using multimodal communication strategies and environmental adaptations and in supporting health professionals to communicate with people with communication disability through staff training (Carragher et al., 2021; O'Halloran et al., 2012; Stans et al., 2017). However, their patients with severe communication may require more than modifications to the environment to support increased monitoring or implementing communication strategies, as these are unlikely to be effective in preventing further falls (Sullivan & Harding, 2019). For these patients, a focus on minimizing harm from falls may be beneficial whilst novel falls prevention strategies are being trialled and implemented.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

There are limitations to the use of patient medical records and incident reports as a source of data about falls. There may be lapses in documentation that mean falls or near miss falls have not been documented and documentation may be illegible or inaccurate, particularly in the case of handwritten medical records such as the records in this study. Furthermore, the use of medical records and incident reports does not account for verbal interactions between staff and patients or between staff members that is undocumented such as interdisciplinary discussions relating to specific strategies to support a patient's communication during transfers, nor does it account for how therapists and staff consider and apply documentation from colleagues (e.g., the implementation of communication strategies during functional tasks). The data source is known to be incomplete, and the sample cannot be considered representative. However, some of the missing or illegible data within this study was addressed using triangulation and matching of medical records and incident reports adding further credibility to the study. Further, given the inpatient rehabilitation setting and participant group is likely to reflect the typical setting and clinical presentation of people with communication disability following stroke, the findings remain applicable to health services providing inpatient rehabilitation services to people with stroke and communication disability.

That the majority of falls described as occurring when patients were taking a risk occurred during a transfer supports previous research by Zdobysz et al. (2005) who suggested that falls during a transfer may arise because the patient is unable to understand verbal instructions and thus take a risk attempting to complete the task independently. Further to this, other studies have suggested that the cognitive difficulties that can occur following a stroke

may further impact the patient's ability to understand their risk of falls and recall their functional limitations thus leading them to attempt activities beyond their abilities (Rabadi et al., 2008; Suzuki et al., 2005; Zdobysz et al., 2005). In addition to this, the cognitive communication difficulties that can occur following a stroke may further impact the patient's ability to use communication aides such as call bells, as well as recall instructions in the correct sequence to complete a task safely. Participants in this study who experienced a fall described by staff as when they were taking a risk were often described in the notes as being 'impulsive', an executive function of cognition. However, specific components of cognitive function and cognitive communication and how they relate to falls risk and the causal factors for falls require further research.

Further research into understanding the views and experiences of patients with stroke and communication disability about their falls may provide further insights into falls in this population. Extending the research beyond analysis of documentation to interviews and direct observations of the ward environment may also provide useful information to enhance prevention strategies, particularly for patients who fall in unknown circumstances, or those who experience multiple falls and have severe communication disability. Further, understanding the views and experiences of health professionals (e.g., nurses, medical doctors, physiotherapists) might provide further context and information regarding the impact of communication disability on falls, including risk, falls prevention strategies and any potential role for speech pathologists in the management of falls in this population.

CONCLUSIONS

This study examined the content of written documentation from medical records and incident reports relating to communication disability in patients with communication disability following stroke. Risk factors for falls specific to communication disability were identified and documented by physiotherapists and occupational therapists during falls risk assessment, however, communication disability risk factors were noted during the documentation of care by nursing staff. Falls that occurred when patients were attempting to address an unmet need or taking a risk were often related to a patient's difficulties communicating their basic needs, gaining attention from staff, and following instructions. There are challenges for staff in implementing falls prevention strategies with patients who have severe communication disability and experience multiple falls. Further research that examines the nuances of cognitive function and cognitive communication difficulties in relation to falls and research that engages the patients

through interviews and observations may enhance understanding of falls in patients with communication disability and further inform falls prevention strategies.

ACKNOWLEDGMENT

Open access publishing facilitated by University of Technology Sydney, as part of the Wiley - University of Technology Sydney agreement via the Council of Australian University Librarians.

CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to report.

DATA AVAILABILITY STATEMENT

The data are not publicly available due to privacy or ethical restrictions.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Sullivan, R., Hemsley, B., Harding, K., & Skinner, I. (2023) 'Patient unable to express why he was on the floor, he has aphasia.' A content thematic analysis of medical records and incident reports on the falls of hospital patients with communication disability following stroke. *International Journal of Language & Communication Disorders*, 1–16. <https://doi.org/10.1111/1460-6984.12916>