


ORIGINAL ARTICLE

Strategies nurses use when caring for patients with moderate-to-severe traumatic brain injury who have cognitive impairments

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Abstract

Aims and objectives: Adults with moderate-to-severe traumatic brain injury (TBI) may have immediate and chronic cognitive impairments that require use of specific nursing strategies. Nurses must be knowledgeable about strategies to use to accommodate these impairments. However, available clinical guidelines and research lack information to direct nonacute nursing management of cognition, limiting guidance for nurses when developing their care plans. The purpose of this study was to investigate strategies nurses use when caring for patients with moderate-to-severe TBI who have cognitive impairments.

Design: Cross-sectional, exploratory study.

Methods: A total of 692 nurses from three hospitals answered the following open-ended question via electronic survey: "Imagine you are caring for a patient with moderate-to-severe TBI who has problems with cognition (e.g., issues with memory, attention, and executive function). Please state your typical nursing routine to care for this type of patient." Data were analysed using summative content analysis. Methods are reported using COREQ guidelines (See File S1).

Results: Most respondents were female (89%), middle-aged (40.3 years), staff registered nurses (77%) practicing on an inpatient unit (51%) with prior experience caring for patients with moderate-to-severe TBI (95%). Nurses described 189 strategies used in their care plan when caring for patients with TBI who have cognitive impairments, including the following: (a) cognitive techniques; (b) communication techniques; (c) patient safety techniques; (d) agitation and behaviour management techniques; and (e) education techniques.

Conclusions: Findings have implications for education and training of nurses, direction for future research aimed at determining the effectiveness of nursing strategies with this patient population, and for development of clinical guidelines for nonacute nursing management of patients with moderate-to-severe TBI who have cognitive impairments.

Relevance to clinical practice: Findings provide foundational knowledge on strategies nurses use when caring for patients with TBI who have cognitive impairments, which could be used to direct evidence-based nursing care of this patient population.

KEYWORDS

care plan, cognitive impairments, nursing, strategies, traumatic brain injury

1 | INTRODUCTION

Traumatic brain injury (TBI), particularly TBIs that are moderate or severe in nature, may cause adult patients to have immediate and chronic cognitive impairments that influence strategies nurses use when caring for these patients. Available research and nursing and interdisciplinary TBI clinical guidelines lack information to direct nonacute nursing management of cognition, which limits guidance for nurses to use in developing their care plans. To address these gaps in knowledge, the purpose of this study was to investigate strategies nurses use in their care plans when caring for adult patients with moderate-to-severe TBI who have cognitive impairments. Findings have implications for education and training of nursing who care for these patients, future research aimed at determining the effectiveness of nursing strategies with this patient population, as well as development of TBI clinical guidelines to direct nonacute nursing management of patients with moderate-to-severe TBI who have cognitive impairments.

2 | BACKGROUND

Globally, more than 69 million people sustain a TBI each year (Dewan et al., 2018), and 2.7 million of these individuals reside in the United States (Centers for Disease Control & Prevention, 2017). TBI is defined as "a bump, blow or jolt to the head or a penetrating head injury that disrupts the normal function of the brain" (Centers for Disease Control & Prevention, 2017). TBI can be characterised as mild, moderate, or severe, with neurological injury severity being defined by indicators such as Glasgow Coma Scale Score, length of loss of consciousness, and presence and length of post-traumatic amnesia (PTA) (Teasdale et al., 2014). Adults who sustain a moderate-to-severe TBI require immediate hospitalisation for critical care and rehabilitation and typically have multiple impairments in cognition, behaviour, communication, emotion and physical functioning (Babikian & Asarnow, 2009). Patients who have cognitive impairments may experience problems with memory, attention, executive functioning, comprehension and processing speed (Babikian & Asarnow, 2009). Impairments in behaviour can manifest as agitation, aggression, impulsivity and hypo-/hyper-activity (Reddy, Rajeswaran, Devi, & Kandavel, 2017). As behaviour involves cognition, cognitive and behavioural problems often occur together (Reddy et al., 2017). Communication impairments may include difficulties with word finding, expressing oneself, understanding what others are saying or picking up on verbal and non-verbal cues (McDonald, Code, & Togher, 2016). Similar to behaviour, communication involves cognition, so many impairments in cognition and communication co-occur (McDonald et al., 2016). Common emotional impairments include anxiety, depression, irritability, motivation and personality changes. Finally, patients with physical impairments

What does this paper contribute to the wider global clinical community?

- We sampled 692 nurses at three hospitals in the United States on the strategies used in their care plans when providing care to adult patients with moderate-to-severe TBI who have cognitive impairments.
- Findings show nurses use 189 strategies spread across 5 major categories, including cognitive, communication, patient safety, agitation and behaviour management, and education techniques.
- Findings have implications for education and training of nurses, direction for future research aimed at determining the effectiveness of nursing strategies with this patient population, and for development of TBI clinical guidelines for nonacute nursing management of patients with moderate-to-severe TBI who have cognitive impairments.

often report headaches and problems with vision, hearing, motor skills, balance and fatigue (Reddy et al., 2017).

The above-listed impairments have major negative effects on adult patients' lives, including chronic problems with employment, relationships, independence and healthcare management (Jaglal et al., 2014). The full recovery trajectory is highly variable, and prognosis and residual effects are difficult to predict (Kothari, 2007; Maas, Marmarou, Murray, Teasdale, & Steyerberg, 2007). As TBI incidence rates are high for young adults (Centers for Disease Control & Prevention, 2017), many survivors live with the residual effects of the injury over their lifespan (Corrigan & Hammond, 2013). When seeking care unrelated to the TBI later in life, the presence of these residual impairments requires that nurses revise their care plans to meet patient needs (Oyesanya, Brown, & Turkstra, 2016; Oyesanya & Snedden, 2018).

Nurses play a multi-faceted role in the care of adult patients with moderate-to-severe TBI throughout the hospital stay, with numerous roles and varying responsibilities as interdisciplinary team members (LeCroy & McMahan, 2015; McNett & Gianakis, 2010). A nurse must (a) assess patient needs, (b) monitor and maintain the patient's condition, (c) coordinate the patient's care, (d) communicate with other interdisciplinary providers about the patient's condition, (e) provide nursing care, (f) prevent further injury, (g) integrate therapy recommendations in the nursing care plan, (h) educate the patient and family, (i) provide emotional support to the patient and family and (j) advocate for the patient (Long, Kneafsey, Ryan, & Berry, 2002; McNett & Gianakis, 2010; Villanueva, 1999). The choice of nursing strategies interventions (i.e., the characteristics of the intervention) is solely

based on the patient's current condition and the patient's and family's current needs, which requires that nurses revise their care plans on a regular basis (LeCroy & McMahon, 2015). In particular, addressing the patient's immediate and residual cognitive impairments caused by the TBI may require the most revisions to the nursing care plan (Oyesanya, Thomas, Brown, & Turkstra, 2016). These cognitive impairments influence the patient's healthcare experience, such as provider–patient communication, (i.e., the patient's ability to converse with and comprehend information from the provider) and the patient's ability to receive and retain educational information (Babikian & Asarnow, 2009).

Given the high prevalence of cognitive impairments among individuals with TBI (Babikian & Asarnow, 2009; Reddy et al., 2017), adapting care plans to accommodate cognitive limitations is particularly important for nursing care; however, there is a dearth of literature on strategies nurses use when caring for adult patients with moderate-to-severe TBI who have cognitive impairments. Similar to the limited research on this topic, there are gaps in evidence-based clinical guidelines for nursing management of adult patients with moderate-to-severe TBI who have cognitive impairments. While there are nursing (American Association of Neuroscience Nurses, 2008) and interdisciplinary clinical guidelines on care of persons with moderate-to-severe TBI (Carney, Totten, & O'Reilly, C., Ullman, J. S., Hawryluk, G. W., Bell, M. J., ... Kisson, N., 2017; Department of Veterans Affairs, 2013; Joint Trauma System, 2017), few sufficiently inform nonacute nursing care and management of patients with moderate-to-severe TBI who have cognitive impairments. In addition, limited research has been conducted to determine whether nurses adhere to available clinical guidelines; however, interdisciplinary research has shown variations in provider adherence to TBI clinical guidelines (Brolliar et al., 2016). The lack of clinical guidelines to inform nursing care and management of this patient population suggests nurses may not have necessary information to guide development of care plans for patients with moderate-to-severe TBI who have cognitive impairments.

As evidence-based care is the standard for nursing care (Melnyk & Fineout-Overholt, 2011), this study seeks to address the lack of research and evidence-based clinical guidelines for nurses to use to direct development of their care plans when caring for patients with moderate-to-severe TBI who have cognitive impairments. Our aim was to shed light on the topic in an effort to direct future research focused on identifying and testing effective nursing interventions for this patient population, which is foundational research for development of evidence-based clinical guidelines. To achieve our aims, we sought to the answer to the following research question: What strategies do nurses use in their care plans when caring for adult patients with moderate-to-severe TBI who have cognitive impairments?

3 | METHODS

3.1 | Design

We conducted a cross-sectional, exploratory qualitative study. The methods of this study are reported in accordance with COREQ guidelines (See File S1) (Tong, Sainsbury, & Craig, 2007).

3.2 | Ethical considerations

We obtained approval from the participating institutional review boards, including approval for a waiver of written consent (Lentz, Kennett, Perlmutter, & Forrest, 2016). The first page of the survey listed the study information sheet, containing information about the study team, purpose and activities, as well as risk and benefits of participating. Participants were notified that their participation was voluntary, confidential and anonymous and that completion of the survey implied consent to participate in the study.

3.3 | Sample

We recruited nurses from three large hospitals in the Midwest: one hospital within a large academic medical centre hospital and two Veterans' hospitals. Nurses were eligible to be in this study if they were employed by one of the participating hospitals.

3.4 | Data collection

Data were collected electronically through a purposive sample. Hospital administrators sent an email to all nurses employed by their facilities ($n = 3,904$) inviting them to participate by clicking a web link to complete an electronic survey. Within the email, nurses were notified that a nurse researcher was conducting a study to learn more about nursing care of patients with TBI and that their participation was voluntary, confidential and anonymous.

We asked nurses to anonymously answer the following open-ended question: "Imagine you are caring for a patient with moderate-to-severe TBI who has problems with cognition (e.g., issues with memory, attention, and executive function). Please state your typical nursing routine to care for this type of patient." The open-ended question was pilot tested with the nursing practice council of a participating hospital before use. Nurses typed their responses into a text box that had no limit on the number of words or characters. We also asked nurses to answer demographic questions, including the following: age, sex, highest nursing degree, years of active nursing practice, years at current position, primary role, primary work setting, age of patients seen and prior experience caring for patients with TBI.

3.5 | Data analysis

We used summative content analysis to analyse our data, which includes interpreting the content and determining the frequency of content (Hsieh & Shannon, 2005). Summative content analysis is a suitable methodology to answer our research question because we aimed to determine the strategies nurses used to care for patients with TBI who have cognitive impairments. This methodology not only allowed us to answer our research question of the strategies used but provided additional information on the frequency of report of the various strategies. We analysed nurses' responses to an open-ended question about their typical plan of care for patients

with moderate-to-severe TBI who have cognitive impairments. At the time of data analysis, the first author was a PhD-prepared nurse researcher with 5 years of experience in qualitative methods and the second author was a research assistant with one year of experience in qualitative methods.

The preparation phase of our analysis began with the selection of the unit of analysis (Elo & Kyngäs, 2008), which was the full response from each participant, ranging from 2–85 words. Next, we attempted to gain a sense of the data as a whole by reading through all responses multiple times (Graneheim & Lundman, 2004). In the organisation phase, we took an inductive approach to develop categories, also known as codes, directly from our data (Graneheim & Lundman, 2004; Hsieh & Shannon, 2005). To do so, we read the data and made notes about important topics that the participants shared. For example, when a participant wrote, “I would repeat important information often,” we noted, “repeats information.” This was our first-order coding (Elo & Kyngäs, 2008). Using our notes, we created a codebook outlining important topics described by participants.

We generated 383 first-order codes, which came directly from the data and were spread across 20 categories. First-order codes from our codebook were then transferred into NVivo, a qualitative data management software program (Bazeley & Jackson, 2013). Next, we grouped codes together based on similarities, also known as higher-order coding (Elo & Kyngäs, 2008). Our higher-order coding led to 231 codes, which were spread across 11 categories. We used NVivo to match our codes with corresponding quotes. As we conducted higher-order coding, we used NVivo to record how frequently each code was described to develop a weighted coding list. The weighted coding list was inserted into a table that recorded the frequency of the code and corresponding quotes. For example, multiple nurses described that they would repeat themselves; this was demonstrated by the following responses:

- “I would repeat instructions more often.”
- “I would have to take the time to be repetitive.”
- “Communication would be more direct and repetitive.”

All responses of this nature ($N = 40$) were coded as “*repeating self when talking to the patient*” in our weighted coding list.

Next, we began the third iteration of data analysis, specifically abstraction, to once again group categories based on similarities and generate category names based on content-characteristic words (Elo & Kyngäs, 2008). Our continued grouping of the codes based on similarities resulted in 189 final codes, which were spread across five major categories. We continued our analysis until saturation was reached, where none of our categories or sub-categories cancelled each other out and all of our data were appropriately encompassed within the final categories (Elo & Kyngäs, 2008). Throughout the data analysis process, the two authors coded independently at each phase of data analysis and met to discuss coding, development of our codebook and quote exemplars; we also discussed discrepancies in coding until consensus was reached.

3.6 | Rigor

In this study, we used multiple strategies to increase the rigor of our qualitative research. First, we analysed all data with a research team with several years of experience in qualitative methods. Second, we wrote memos throughout our analysis to create an audit trail to describe how we conducted our analysis and the analytical decisions we made through the analysis process. Finally, we selected categories that covered a wide range of strategies used by nurses in our sample and ensured we used quote exemplars throughout our findings to provide additional evidence of our results (Sandelowski, 1986, 1993).

3.7 | Trustworthiness

In qualitative research, trustworthiness of findings is often discussed in terms of transferability, credibility, confirmability and dependability (Elo et al., 2014; Graneheim & Lundman, 2004). Transferability refers to the detailed description of the scope of one's results so that findings may be applicable to other contexts (Elo et al., 2014; Graneheim & Lundman, 2004). To ensure our results were transferable, we provided a detailed description of our sample and data collection and analysis process in our method sections so that the reader may be able to understand the context in which our study was conducted. Credibility refers to rich and accurate descriptions of the topic or phenomenon of interest (Elo et al., 2014; Graneheim & Lundman, 2004). Similarly, confirmability refers to the need to ensure interpretations and findings match the data (Elo et al., 2014; Graneheim & Lundman, 2004). We ensured both credibility and confirmability by providing rich, detailed descriptions of our findings with quote exemplars as evidence of our results to clearly describe the strategies nurses use when caring for patients with TBI who have cognitive impairments. Dependability refers to the ability to reproduce findings (Elo et al., 2014; Graneheim & Lundman, 2004). Although not yet determined if our findings can be reproduced, one way to increase the likelihood of reproducibility is to provide a detailed audit trail with a clear description of data collection and analysis procedures (Elo et al., 2014; Graneheim & Lundman, 2004). To increase likelihood of dependability, our methods section serves as our audit trail, where we have outlined, in detail, the steps we took to collect and analyse our data.

4 | RESULTS

A total of 692 nurses from the three Midwestern hospitals responded to our survey. As approximately 3,904 nurses received our initial email, the overall response rate was 17.7%, which is typical for electronic surveys (Shih & Fan, 2009). Most respondents were from a Level I trauma centre (65% from the public hospital; 27% from the Veterans' hospitals), and were female (89%), middle-aged (40.3 years), with a bachelor's degrees (67%). Although most nurses identified as a staff registered nurse (77%), nursing roles included advanced practice

registered nurses (5.6%), charge nurses (5%), nurse managers (3.8%) and other (8%). The majority of nurses worked on an inpatient unit (51%) followed by an ambulatory clinic (15%), primary care clinic (4.6%), emergency department (4.5%) and miscellaneous (26%; e.g., operating room, radiology, outpatient surgery). Approximately 95% of nurses sampled reported that their clinical practice has ever included patients with moderate-to-severe TBI.

The final 5 categories described strategies nurses use when caring for patients with moderate-to-severe TBI who have cognitive impairments, including the following: (a) cognitive techniques, (b) communication techniques, (c) patient safety techniques, (d) agitation and behaviour management techniques, and (e) education techniques. Strategies are listed in rank order in Table 1, and an overview is provided in Figure 1.

4.1 | Cognitive techniques

Nurses most frequently described using cognitive techniques in their care plans to directly address issues with cognitive impairments. More than 40% of nurses in our sample described addressing memory problems; frequently assessing the patient's cognition; and addressing problems with attention, organisation, and executive functioning. Nurses described using frequent reminders, such as "keep a schedule posted in room," "write my care plan on the board for them," and "provide visual reminders to help patient with memory, attention, executive function (post its, photos with name labels, etc.)." Nurses also described using repetition, as a nurse stated, "Right at the start of each interaction, remind the patient who I am and where we are and what our plan is for that moment."

When assessing the patient's cognition, nurses described they would assess the patient's cognitive status and orient the patient to "person, time, situation, and place, and foreshadowing of events to come in the future." When addressing problems with attention, nurses described giving simplified instructions, such as "an ordered checklist for that person to use every time he or she needs to complete a task relating to self-care."

4.2 | Communication techniques

The next most commonly described strategy was communication techniques. Approximately 37% of nurses in our sample described specific communication techniques they would use with patients and staff, including changing the way they asked questions, assisting the patient with communication, changing the delivery of communication, explaining things and communicating with other staff about the patient. One nurse encompassed several of these strategies in his or her statement, "I would be more repetitive when talking; I would start my sentences with their names to keep their attention; I would try to keep my conversations short and concise to not confuse or overwhelm them."

When changing the delivery of communication, nurses described repeating themselves and using lay terms when conversing with the patient. One nurse stated, "I tend to repeat myself every

time I go into the room to make sure the patient understands who I am and what I am doing." When attempting to ensure the patient understood the information that had been communicated, nurses described asking the patient to restate what they heard. A nurse stated, "I would have the patient repeat back and demonstrate to me." When explaining things to patients, nurses described that they went over the procedures, why the procedures were necessary, and how these procedures were a part of the care plan. Finally, nurses described changing communication with other staff by letting them know, for example, "that I will need additional uninterrupted time to work with this patient."

4.3 | Patient safety techniques

Almost 23% of nurses in our sample described using patient safety techniques as a strategy to keep the patient with moderate-to-severe TBI safe. Many of the strategies nurses described centred on protection of the patient's physical safety as safety risks were increased due to the patient's cognitive, behavioural and physical impairments. Techniques included the following: changing assessment of the patient, reassuring the patient that he or she is safe and implementing fall prevention strategies. Changes to patient assessment methods focused on evaluating the patient more frequently, as one nurse stated it was important to conduct "frequent safety rounds since they [the patient with TBI] are more likely to have behaviour issues and balance/gait issues making them more at risk of harming themselves." When implementing fall prevention techniques, nurses described putting the patient on high fall risk precautions, such as using a constant visual observer or sitter, employing a bed or chair alarm and placing the patient close to the nurses' station, evidenced by this quote exemplar from a nurse, "I would probably have a personal safety attendant with the patient and at the very least bed/chair alarms."

4.4 | Agitation and behaviour management techniques

Techniques in this category focused on strategies nurses used to prevent or deal with agitation or behaviour problems of patients with TBI. Approximately 13% of nurses sampled described incorporating strategies to manage agitation and behaviour problems in their care plans. Nurses did so by allowing the patient's brain to rest, preventing agitation and dealing with agitation. To allow the patient's brain to rest, nurses described they would establish a structured daily routine, schedule breaks in tasks and move slowly. Multiple nurses stressed the importance of decreasing stimulation around the patient with TBI. A few nurses described specific strategies to prevent agitation, such as one who stated: "I would try to limit the amount of stimulation to just me talking at the time I was with the patient. (i.e., try to limit visitors, turn off the TV, mute the sound of the TV, etc.). If anything would start to agitate the patient, I would immediately discontinue the task and try again later." If agitation occurred, nurses described they would prevent patient violence towards staff or family caregivers. However, strategies to prevent patient violence were unspecified.

TABLE 1 Strategies nurses use in their care plans when caring for patients with TBI who have cognitive impairments^a

Modification Strategies.	Frequency of nurse descriptions
Cognitive Techniques	271
Addressing memory problems	136
Using visual reminders	69
Writing things down (on paper, on a whiteboard or in general)	52
Posting pictures of family or having family bring familiar objects	13
Using signs to help patient remember things	4
Using frequent verbal reminders or cueing	28
Using repetition	26
Reintroducing self to patient multiple times	14
Using other tools to help with memory (e.g., tactile tools, alarm for meds, personal one-page fact sheet, daily calendar for routine, memory book)	23
Talking to family members about pertinent information	2
Addressing problems with attention by giving instructions	75
Simplifying instructions	36
Giving patient step-by-step directions	17
Redirecting patient as needed	10
Asking the patient to do simple tasks	7
Having patient practice things independently	3
Keeping patient occupied	2
Assessing patient's cognition	60
Orienting patient frequently	47
Reorienting patient to person, place, time and situation	47
Assessing patient's cognitive status	13
Communication Techniques	256
Changing delivery of communication	148
Repeating self when talking to the patient	52
Using lay terms when talking to the patient	25
Being clear and direct when talking to the patient	23
Speaking slowly when talking to the patient	16
Using shorter sentences when talking to the patient	13
Talking to family member	5
Having shorter conversations with the patient	4
Using pictures to communicate with patient	3
Making sure patient is paying attention when nurse is talking	3
Maintaining eye contact with patient when talking	2
Listening to patient	2
Explaining things	37
Explaining procedures to patient and stating why you are doing procedure	27
Explaining plan of care to patient	10
Changing the way questions are asked	11
Keeping questions short or simple	9
Asking more important questions first	2
Ensuring patient understands communication	9
Having patient demonstrate	4
Asking patient what he or she understood from the communication	4

(Continues)

TABLE 1 (Continued)

Modification Strategies.	Frequency of nurse descriptions
Assisting patient with communication	5
Giving patient more time to respond	3
Giving patient options for answers	2
Communicating with other staff about patient	1
Patient Safety Techniques	158
Changing assessment of patient	94
Assessing patient frequently	65
Assessing patient needs	29
Implementing fall prevention strategies	64
Using additional safety techniques (bed alarm, chair alarm, etc.)	19
Placing patient on high fall risk precautions	14
Having a constant visual observer to ensure patient is safe	14
Putting patient close to nurses' station	13
Communicating with other staff about patient's safety risks	2
Keeping patient's room clutter free	2
Agitation and Behaviour Management Techniques	89
Allowing patient's brain to rest	49
Establishing a structured daily routine	23
Moving slowly	14
Scheduling breaks	4
Making sure patient is resting or sleeping as much as possible	3
Putting sign on the door (e.g., brain rest needed)	3
Limiting number of visitors and length of stay	2
Preventing agitation in patient	36
Decreasing the amount of stimulation around patient	31
Providing nursing cares without increasing stimulation	5
Dealing with agitation in patient	4
Preventing patient violence towards staff or family caregivers	4
Education Techniques	71
Using multiple teaching sources	27
Teaching the family or having family member present during teaching	16
Using visual materials	11
Using written information	8
Using pictures	3
Changing timing, frequency or duration of teaching sessions	16
Holding shortened teaching sessions	16
Assessing patient's or family member's learning style or prior knowledge of information	16
Assessing patient's or family member's understanding of teaching	13
Increasing patient's understanding of teaching	9
Repeating teaching or frequently referencing teaching at later points	9

^aThe frequencies are specific to the category, sub-category or lower-level strategy and are not always summative.

4.5 | Education techniques

About 10% of nurses in our sample described strategies to try to improve the effectiveness of their education when teaching patients with TBI and their family members. Nurses described using multiple

teaching sources; changing the timing, frequency or duration of teaching sessions; assessing patients' and family members' learning styles or prior knowledge of information to be delivered; assessing understanding of teaching; and increasing the patients' understanding of the information presented.

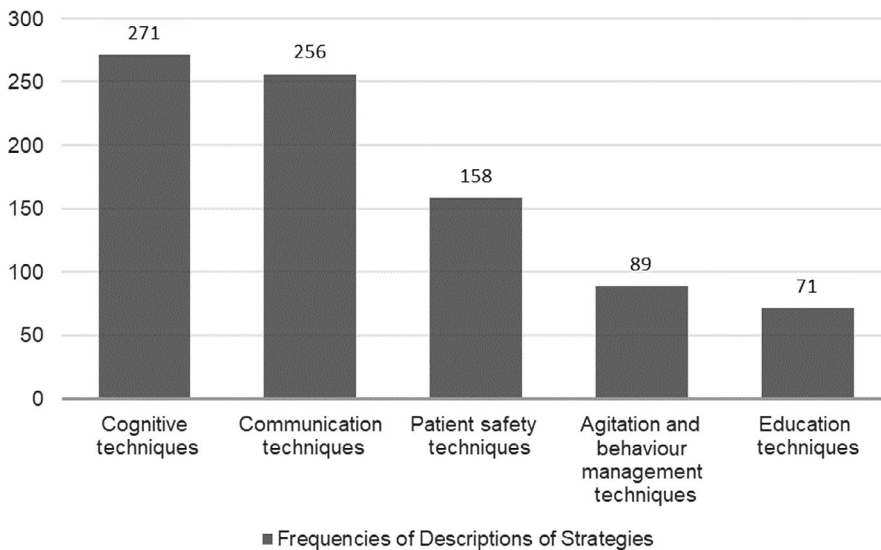


FIGURE 1 Strategies nurses use in their care plans when caring for patients with traumatic brain injury (TBI) who have cognitive impairments

When using multiple teaching sources, nurses emphasised the importance of including a patient's family member(s) during teaching. One nurse wrote, "I would be sure to pull in the family very early and begin educating them on what is happening and why." Other nurses described using written or visual materials as a guide for the education they were providing. When changing the timing, frequency or duration of teaching sessions, one nurse described he or she would "spread teaching out over numerous sessions."

Nurses also described the importance of assessing patients' and family members' learning styles or prior knowledge of the information to be delivered to ensure relevant teaching was delivered in an appropriate manner. To assess understanding of information presented, nurses described using the teach-back method, whereby the nurse asked the patient or family member to explain what they understood. Finally, to increase the patient's understanding of what the nurse taught, nurses described reinforcing teaching sessions by repeating the teaching or frequently referencing it later.

5 | DISCUSSION

The purpose of this study was to investigate the strategies nurses use in their care plan when caring for patients with moderate-to-severe TBI who have cognitive impairments. Findings describe approximately 189 strategies nurses use in their care plans, including cognitive, communication, patient safety, agitation and behaviour management, and education techniques. The three most commonly used types of nursing strategies were cognitive techniques, communication techniques and patient safety techniques. This study has generated new knowledge on this topic, as few studies have assessed strategies providers use to care for patients with cognitive impairments, including patients with moderate-to-severe TBI (Alverzo, 2004; Collis & Bloch, 2012; Oppikofer & Geschwindner, 2014).

Approximately 40% of nurses in our sample described they would use cognitive techniques in their care plan to address problems with the patient's cognition. Focusing on the patient's cognition is important because cognitive impairments can affect the patient's healthcare experience (Oyesanya, Thomas, et al., 2016), as well as the patient's ability to learn strategies throughout the hospital stay to use to independently manage their health, wellness and safety after discharge (Oyesanya, Thompson, Arulsevam, & Seel, 2019). Research shows providers' efforts to address cognition during the hospital stay can help the patient develop compensatory strategies to manage cognitive problems at home (Turkstra, 2013), which can occur with nurses through therapy integration (McNett & Gianakis, 2010).

Similarly, approximately 37% of nurses in our sample described they used a number of communication strategies, such as changing the way they communicate with the patient with TBI, likely because cognitive and communication disorders often co-occur (McDonald et al., 2016; Turkstra, Politis, & Forsyth, 2015). Using effective communication techniques is particularly important because patients with communication impairments are at higher risk for poorer outcomes compared to patients without communication impairments as communication impairments may prevent effective patient-provider communication about patient needs (Patak et al., 2009). In addition, communication is related to quality of care, as effective patient-provider communication can increase patient adherence to the treatment regimen (Piette, Schillinger, Potter, & Heisler, 2003). Nursing literature recommends that nurses use a patient communication assessment tool to allow for a thorough assessment of barriers to effective communication such as those caused by literacy, linguistic, behavioural, cultural or physical barriers (Patak et al., 2009). Subsequently, the tool provides guidance on nursing interventions that can be implemented to address the patient's communication needs (Patak et al., 2009). However, nurses in our sample did not describe strategies used to assess the patient's communication impairments or

describe use of communication assessment tools of any kind. It is unclear whether nurses are aware of or are using assessment tools or strategies and corresponding nursing interventions to address communication impairments in patients with moderate-to-severe TBI. In addition, as both nurses and speech-language pathologists work closely with patients with cognitive and communication impairments, there is an opportunity for speech therapists and nurses to collaborate to address the patient's issues with cognition and communication to improve patient outcomes (Dondorf, Fabus, & Ghassemi, 2015; Ghassemi & Fabus, 2017).

Our findings add to the literature by documenting nonpharmacological strategies nurses use to manage agitation and behaviour problems in patients with TBI who have cognitive impairments (Alverzo, 2004; Mortimer & Berg, 2017). Recent research on nursing management of agitation in patients with TBI also recommends nurses promote patients' sleep-wake cycles and use alternative strategies such as aromatherapy, massage therapy and music to prevent and address agitation in this patient population (Mortimer & Berg, 2017). As agitation is a common phase of recovery for patients with moderate-to-severe TBI (Mortimer & Berg, 2017) and can have an influence on short- and long-term outcomes for persons with moderate-to-severe TBI (Babikian & Asarnow, 2009; Bogner, Corrigan, Fugate, Mysiw, & Clinchot, 2001), it is important nurses have appropriate strategies to use when faced with this issue. However, few nurses in our sample (12.8%) described using strategies to manage agitation and behaviour problems. Our low reports from nurses on strategies to address agitation and behaviour problems may be due to the unpredictable nature of behaviour after an individual sustains a moderate-to-severe TBI (Mortimer & Berg, 2017); management of agitation can be challenging for the nurse, especially if the patient becomes physically aggressive (Oppikofer & Geschwindner, 2014). Low reports of strategies to manage agitation and behaviour problems may also be due to limited training and education focused on management of patients with moderate-to-severe TBI who have cognitive impairments in nursing school curriculum and on the job (Oyesanya, Brown, et al., 2016; Oyesanya, Thomas, et al., 2016). These findings suggest the need for additional training for nurses who care for patients with TBI who have cognitive impairments, particularly to learn effective strategies to use in management of agitation and behaviour problems.

The list of strategies described by nurses in our sample is by no means exhaustive. For instance, nurses did not describe strategies used to address nutrition in patients with TBI who have cognitive impairments, even though research shows this patient population may have nutritional deficits (Cook, Peppard, & Magnuson, 2008) and that adequate nutrition is needed to promote cognitive functioning (Bistrrian, Askew, Erdman Jr, & Oria, 2011; Schmitt, 2010). Although development and implementation of a person- and family-centred nursing care plan is a gold standard in nursing care (Lor, Crooks, & Tluczek, 2016), nurses in our sample did not describe many strategies that could be used to make care more person- and family-centred. In addition, nurses in our sample did not describe use of assessment tools that may be useful in communicating the patients' status to

other providers, such as the Ranchos Los Amigos Level of Cognitive Functioning Scale, Agitated Behavior Scale, Galveston Orientation and Amnesia Test, Disability Rating Scale, Functional Independence Measure and Functional Assessment Measure. Although nurses may require training before use of these tools, these tools could help nurses with effective care plan development and effective communication of the patient's status to the interdisciplinary team.

5.1 | Strengths and limitations

Strengths of this study include a large sample size with nurses from three hospitals. However, this study is not without limitations. First, we asked nurses to state their typical care plan when caring for patients with moderate-to-severe TBI who have problems with cognition (e.g., issues with memory, attention and executive function). Nurses responded with one or more strategies they would use, whether or not these strategies were effective. Nurses may have not have prioritised their responses and may have written only one strategy, even though multiple strategies may be necessary to adequately care for this patient population. However, more than 50% of nurses in our sample described two or more strategies, which were useful in our findings. Second, we did not analyse nurses' responses based on their hospital unit or frequency of caring for patients with moderate-to-severe TBI; strategies nurses described might have differed based on these variables. Instead, we elected to count the frequency of report, if one assumes frequency of report is one way of determining relevance. Third, we did not ask nurses to specify whether the strategies they described were relevant to care of patients in the acute or chronic phase of TBI recovery. Although more strategies may be needed for patients with moderate-to-severe TBI in the acute phase of recovery, these findings still contribute to the limited literature on this topic and provide a foundation for future research focused on nursing care of patients with TBI. Finally, although our response rate of 17.7% is considered typical of electronic surveys (Shih & Fan, 2009), the results of our study may not be representative of the strategies used by all nurses who care for patients with moderate-to-severe TBI who have cognitive impairments in the United States or across the world. However, our large sample size of nurses from three hospitals and similarities (based on type of technique) among strategies reported by our nurse participants imply that the strategies described in our results may be commonly used by nurses who care for the patient population.

6 | FUTURE RESEARCH

Future researchers may wish to compare our findings to the strategies recommended by TBI nursing practice experts, perhaps using the Delphi method to come to consensus on nursing strategies (Hsu & Sandford, 2010). In addition, research is needed to determine which nursing strategies are most effective for nurses to use when caring for patients with moderate-to-severe TBI who have cognitive impairments; this research is necessary because it is important

to base practice on evidence rather than typicality of practice or expert recommendations. Other researchers may wish to investigate differences in strategies nurses use based on work setting, as nurses who practice on hospital units where patients with TBI regularly receive care (such as the emergency room, intensive care unit, or inpatient rehabilitation) may use different strategies compared with nurses who practice on units where patients with TBI are seen less frequently.

7 | CONCLUSION

In our sample, 692 nurses from three hospitals described strategies they use in their care plans for patients with moderate-to-severe TBI who have cognitive impairments. Approximately 189 strategies were described, most commonly addressing impairments in patients' cognitive abilities, various means of patient-provider communication and patient safety techniques, as well as strategies for education and managing agitation and behaviour. Results demonstrate the need for further research on the effectiveness of these nursing strategies to provide guidance for nurses to use when caring for these patients with moderate-to-severe TBI who have cognitive impairments. Our findings also provide direction for development of nursing education and training and for development of clinical guidelines on nonacute nursing management of cognitive impairments when caring for patients with moderate-to-severe TBI.

8 | RELEVANCE TO CLINICAL PRACTICE

Although our list of nursing strategies is not exhaustive, our findings provide a resource for nurses to use when caring for patients with moderate-to-severe TBI who have cognitive impairments; whether the nurse is a novice, experienced or switching patient populations, he or she may find strategies to use in their care plan within our findings. Dissemination of these findings to nurses who care for patients with TBI who have cognitive impairments could occur at an individual-, unit- or hospital-level via multiple avenues, such as independent, online modules; small group trainings with a clinical nurse specialist or nurse educator; and lunch and learn presentations from a TBI expert for individual hospital units or during a hospital-wide seminar. Finally, with limited clinical guidelines to direct nonacute nursing management of patients with moderate-to-severe TBI who have cognitive impairments, these findings can provide a foundation for testing the effectiveness of these nursing strategies, which can guide clinical decision-making and development of clinical guidelines that can be used to inform nursing practice.

The usefulness of our findings is demonstrated in the statement, "nurses' clinical reasoning incorporates experiential, formal, and informal knowledge and uses both inductive and deductive cognitive skills to solve problems" (Rice, Bennett, Clesi, & Linville, 2014, p. 137). Our findings describe a combination of experiential, formal and informal knowledge nurses have gained while caring for

patients with moderate-to-severe TBI who have cognitive impairments, which can be used to facilitate education and training of other nurses. As peer-to-peer education, such as asking a colleague a question, is preferred by nurses (Oyesanya, Thomas, et al., 2016; Secomb, 2008), our findings summarise relevant knowledge about care of patients with moderate-to-severe TBI, described by nurses, suitable for nurses.

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CONFLICTS OF INTEREST

The authors report no conflicts of interest.

DATA AVAILABILITY

Please contact the first author for access to the data set used in this study.

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SUPPORTING INFORMATION

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

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