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Review

Ward-based interventions for patients with hemispatial neglect in stroke rehabilitation: A systematic literature review

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ABSTRACT

Objectives: To identify rehabilitation interventions that can be integrated into ward-based nursing for patients with hemispatial neglect following stroke in the right brain hemisphere.
Design: A systematic review of interdisciplinary literature.
Data sources: A preliminary literature search without time limits was conducted in the Cochrane Controlled Trials Register. We then searched the PubMed, CINAHL and PsychINFO databases for relevant articles published between January 2006 and June 2014. Selected journals were searched manually. Additional resources were explored by scrutinizing reference lists and tracking citations of the selected articles.
Review methods: Titles and abstracts were matched with the inclusion criteria. Articles were read in their entirety if the abstracts adhered to inclusion criteria or if there was any uncertainty. Two reviewers evaluated the risk of methodological bias independently by using quantitative appraisal forms from the Johanna Briggs Institute (JBI). Any disagreements were resolved by consensus. Authors of nine studies were contacted to acquire additional information. The JBI Reviewers' Manual was used to guide the overall procedure of the review. We used the PRISMA statement to ensure precise reporting of the results. The selected studies were graded according to the strength of their evidence (Levels 1–5); the proposed interventions were given recommendation grades (Grades A–D).
Results: Using 41 original studies, 11 interventions were identified. These comprise: (1) contralesional neck vibration (Grade C); (2) emotionally salient stimuli and reward (Grade D); (3) family participation and intensity of training (Grade C); (4) limb activation training (Grade C); (5) mental imagery training, (Grade D); (6) mirror therapy (Grade C); (7) music therapy (Grade D); (8) right half-field eye patching (Grade D); (9) smooth pursuit eye-movement training (Grade B); (10) virtual reality and computer-based training (Grade C); and (11) visual scanning training (Grade D).
Conclusion: A total of 11 promising rehabilitation interventions were found. Encouraging results were, in particular, seen with smooth pursuit eye-movement training. It should be

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noted that the general low level of evidence and the diversity of interventions makes it difficult to endorse specific priorities and combinations for implementation. Instead, interventions should be applied after careful evaluation of each patient's unique capacities and problems. We include suggestions for operationalization into ward-based care in "Discussion" section. We also emphasize the need to integrate evidence-based interventions into nursing care to further stimulate rehabilitation outcomes and future research.

What is already known about the topic?

- Hemispatial neglect following stroke is associated with greater functional impairment than is seen in stroke patients without this deficit.
- Interventions that are provided in addition to conventional therapy sessions might enhance the outcome of stroke rehabilitation.
- There is a lack of nursing interventions for patients with hemispatial neglect that are based on research evidence.

What this paper adds

- We found 11 evidence-based interventions that nurses can use in interdisciplinary collaboration to enhance outcomes in patients with hemispatial neglect.
- The findings of the review provide a foundation on which to develop structured interventions that can be incorporated into ward-based rehabilitation of patients with hemispatial neglect.
- We recommend how the evidence-based interventions may be incorporated into daily care and provide important knowledge derived from a team of interdisciplinary professionals with expert skills on hemispatial neglect.
- We identify gaps in current knowledge and in the methodologies used to study neglect.

1. Introduction

Stroke is a common neurological affliction; when considered in isolation from other cerebrovascular disorders, it is the fourth leading cause of death worldwide and the principal reason for disability in community settings (Go et al., 2013; Miller et al., 2010). Hemispatial neglect is a heterogeneous disorder that hinders optimal recovery after stroke and makes it difficult for patients to incorporate new strategies into daily life (Barrett et al., 2006; Bartolomeo, 2014).

The incidence of neglect subsequent to right hemisphere strokes ranges from 13% to 82% (Azouvi et al., 2002; Bowen et al., 1999). Although neglect can occur after damage to either the right or left hemisphere, it is considered more common, severe, and long-lasting following stroke in the right brain hemisphere (Halligan et al., 2003). To illustrate, one study has shown that neglect occurs in 26% of patients with right-sided brain damage and 2% with left-sided brain damage (Becker and Karnath, 2007). The reported incidence rates should be interpreted with caution due to the tremendous variability in patient selection and the different methods used to ascertain the presence of neglect (for more details, see Barrett et al., 2006).

The neglected space is located on the contralesional (opposite) side of the brain damage. However, patients commonly exhibit increased attention to events occurring towards the ipsilateral (same) side (Mark, 2003). The compound appearances of neglect are reflected in its definition as "the impaired or lost ability to respond to sensory stimuli (visual, auditory, tactile, olfactory) presented in the contralesional hemispace of a neurologic patient" (Kerkhoff and Schenck, 2012, p. 1072). Altered attentional abilities further complicate the clinical picture (Posner et al., 1984; Valler and Bolognini, 2014; van Kessel et al., 2010). The spatial biases of neglect are obvious when patients alter their actions disproportionately toward the ipsilesional side. Examples include leaving dinner uneaten on the neglected side of the dinner plate, colliding with objects, failing to dress on the left side, and so forth. Difficulties range from slightly delayed responses at the left-hand side to instances in which patients have their head and gaze constantly fixed toward the unaffected right-hand side, while completely disregarding stimuli provided from the neglected left-hand side. In spite of obvious deficits, patients may persistently deny their neglect problems (Bartolomeo, 2014).

In comparison to stroke patients without neglect, well-known ramifications include greater functional impairment, in particular with regard to self-care, locomotion and transfers (Nijboer et al., 2013a); less likelihood of independent living (Heilman, 2009); increased risk of falls and other injuries (Campbell and Matthews, 2010; Czernuszenko and Czlonkowska, 2009); less participation in life (Brozzoli et al., 2006); and additional burdens on caregivers (Buxbaum et al., 2004). Hemispatial neglect is also an important predictor for reduced satisfaction with life one year after stroke (Franceschini et al., 2010; Verhoeven et al., 2011). Spontaneous recovery is most common within the first 12–14 weeks following stroke. However, complete remission is not often achieved (Farnè et al., 2004; Nijboer et al., 2013b). For an estimated one third of patients, the neglect becomes chronic (Karnath et al., 2011; Rengachary et al., 2011).

The clinical importance of neglect has led to the development of interventions based on activating ways of learning via top-down and/or bottom-up methods (Luauté et al., 2006). Top-down approaches trigger the patient's awareness of his or her neglect-related deficits and entail active patient participation. Typical top-down interventions include (self)cueing and visual scanning training. In contrast, bottom-up interventions work by means of passive sensory manipulation. Representative examples of bottom-up interventions include neck vibration and prism adaptation (Luauté et al., 2006).