
**CLINICAL BOTTOM LINE:**

Traumatic brain injury (TBI) is a common diagnosis seen by occupational therapists in many settings. Often, people who have experienced a TBI have an impaired ability to understand their own weaknesses or strengths and how they affect the person’s daily functioning; this ability is also known as self-awareness. Self-awareness can be explained further when it is broken into two components, “intellectual awareness, involving self-knowledge and beliefs about one’s abilities, and online awareness, involving the capacity to self-monitor and adjust one’s behavior (self-correction of errors) during task performance” (p. 317). Occupational therapists implement metacognitive training with TBI patients to improve patients’ online awareness through self-regulation of errors while they are performing meaningful occupations. A main component of metacognitive training is feedback provided to the patient from the occupational therapist, which is often verbal feedback.

This article provides evidence to support the use of video feedback in combination with verbal feedback from occupational therapists to improve online and intellectual awareness in patients with a diagnosis of TBI. Participants were randomly assigned into three feedback groups (video, verbal, and experiential) and then participated in four meal preparation tasks. Participants in the video feedback group significantly improved intellectual awareness, measured by an Awareness Questionnaire (AQ), and significantly improved (both statistically and clinically) online awareness, measured as the total number of errors made during a meal preparation task.

Overall, this Level I randomized controlled trial study is moderate for measures of internal validity. One strength of the intervention is that the assessor who counted the errors was blinded to which group the participants were a part of. Another is the number of participants in the study. However, there are some weaknesses of the intervention. One weakness is the difference in setting where the participants completed the cooking tasks. A majority of the tasks were completed in the inpatient rehabilitation kitchen, but some participants completed the activities at home. Another weakness of the intervention is the use of three occupational therapists interchangeably among the three groups.

The evidence from this study can be used in the future with patients who have an impairment in self-awareness from a TBI, but more research should be completed before the evidence can be generalized to populations with other diagnoses or to different settings. Additionally, to determine the number of sessions needed to improve intellectual and online awareness, more research is needed.
RESEARCH OBJECTIVE(S)
List study objectives.

To “evaluate the effectiveness of feedback interventions for improving online awareness in individuals with TBI” (p. 317) by comparing the three feedback interventions: verbal feedback, video plus verbal feedback, and experiential feedback
Also, to investigate how the three feedback interventions affected the participant’s self-perceptions of rehabilitation, emotional status, and intellectual awareness

DESIGN TYPE AND LEVEL OF EVIDENCE:
Level I: Randomized controlled trial

SAMPLE SELECTION
How were subjects recruited and selected to participate? Please describe.

Participants were recruited between November 2009 and March 2012 from admissions to a brain injury unit composed of an inpatient and community rehabilitation facility in Sydney.

Inclusion Criteria

• >16 years old
• Experienced a TBI
• Functional English language speaker
• Recovered from posttraumatic amnesia
• Impaired self-awareness, defined by the researchers as “having a positive discrepancy of at least two points between participant and therapist ratings on the Awareness Questionnaire (AQ) . . . used in conjunction with observation or errors in performance of a cooking task” (p. 317)

Exclusion Criteria

• Behavior changes that affected ability to participate in meal preparation task or feedback intervention
• Communication disability
• Expected rehabilitation less than the length of the study (i.e., 2 weeks)
• Completed a meal preparation task at baseline with no errors

SAMPLE CHARACTERISTICS

N= (Number of participants taking part in the study) 54

#/ (%) Male 46/(85%)  #/ (%) Female 8/(15%)
**Ethnicity**

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<tr>
<th>Ethnicity</th>
<th>Count/Percentage</th>
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<tbody>
<tr>
<td>Australian</td>
<td>36/(67%)</td>
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<tr>
<td>Asian</td>
<td>10/(19%)</td>
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<tr>
<td>European</td>
<td>8/(14%)</td>
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**Disease/disability diagnosis**

<table>
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<th>Diagnosis</th>
<th>Count/Percentage</th>
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<tr>
<td>TBI</td>
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**Cause of injury:**

- Road traffic accident 40/(74%)
- Fall 11/(20%)
- Assault 3/(6%)

**INTERVENTION(S) AND CONTROL GROUPS**

*Add groups if necessary*

**Group 1: Video feedback group**

**Brief description of the intervention**

Participants completed a meal preparation task four times, with 2–4 days between each task. Participants were videotaped while they performed the meal preparation task. They had three meal options to choose from: ham and cheese omelet with toast, mashed potatoes and sausages, or spaghetti bolognaise. The participants selected one of the three meals to prepare for all four sessions. Additionally, participants were provided with a written recipe before the meal preparation task and were able to make modifications to the recipe to fit their personal habits and preferences.

During the task, an occupational therapist used the “pause, prompt, praise” technique to provide feedback and cues. Furthermore, the occupational therapist did not immediately cue the participant when an error was made but instead allowed him or her time to self-correct the error. If the participant did not correct the error in 2–5 s, the occupational therapist provided a general prompt. If the participant continued to make the error, the occupational therapist provided a more specific prompt. Additionally, the occupational therapist provided positive feedback when the participant corrected an error after a prompt. After completion of the activity, the participant and the occupational therapist completed the Meal Independence Rating Scale (MIRS) and rated how well they performed the task.

After completion of the task, participants who were randomly assigned to the video feedback group watched the video of their performance with the occupational therapist. While watching the video, the occupational therapist had the participants look for their errors and strengths, as well as think of strategies they could implement the next time they completed the task. After watching the video, the occupational therapist and the participant verbally discussed their MIRS score.
<table>
<thead>
<tr>
<th>How many participants in the group?</th>
<th>18</th>
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| Where did the intervention take place? | - Kitchen of rehabilitation hospital for inpatient participants  
- Kitchen of participant’s home for participants in community rehabilitation |
| Who Delivered? | Three occupational therapists |
| How often? | Each participant completed four cooking tasks, with 2–4 days between tasks. Baseline measurements were taken at the first intervention session. Postintervention measurements were taken during the last session. |
| For how long? | Time required to prepare the meal |

**Group 2: Verbal feedback group**

| Brief description of the intervention | Participants completed a meal preparation task four times, with 2–4 days between each task. Participants were videotaped while they performed the meal preparation task. They had three meal options to choose from: ham and cheese omelet with toast, mashed potatoes and sausages, or spaghetti bolognaise. Additionally, participants were provided with a written recipe before the meal preparation task and were able to make modifications to the recipe to fit their personal habits and preferences.  
During the task, an occupational therapist used the “pause, prompt, praise” technique to provide feedback and cues. Furthermore, the occupational therapist did not immediately cue the participant when an error was made but instead allowed him or her time to self-correct the error. If the participant did not correct the error in 2–5 s, the occupational therapist provided a general prompt. If the participant continued to make the error, the occupational therapist provided a more specific prompt. Additionally, the occupational therapist provided positive feedback when the participant corrected an error after a prompt. After completion of the activity, the participant and the occupational therapist completed the MIRS and rated how well they performed the task.  
After completion of the task, participants who were randomly assigned to the verbal feedback group verbally discussed their MIRS scores and any difference in ratings with the occupational therapist. |
| How many participants in the group? | 18 |
| Where did the intervention take place? | • Kitchen of rehabilitation hospital for inpatient participants  
• Kitchen of participant’s home for participants in community rehabilitation |
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<tr>
<td>Who Delivered?</td>
<td>Three occupational therapists</td>
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<tr>
<td>How often?</td>
<td>Each participant completed four cooking tasks, with 2–4 days between tasks. Baseline measurements were taken at the first intervention session. Postintervention measurements were taken during the last session.</td>
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<td>For how long?</td>
<td>Time required to prepare the meal</td>
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**Group 3: Experiential group**

| Brief description of the intervention | Participants completed a meal preparation task four times, with 2–4 days between each task. Participants were videotaped while they performed the meal preparation task. They had three meal options to choose from: ham and cheese omelet with toast, mashed potatoes and sausages, or spaghetti bolognaise. Additionally, participants were provided with a written recipe before the meal preparation task and were able to make modifications to the recipe to fit their personal habits and preferences.  
During the task, an occupational therapist used the “pause, prompt, praise” technique to provide feedback and cues. Furthermore, the occupational therapist did not immediately cue the participant when an error was made but instead allowed him or her time to self-correct the error. If the participant did not correct the error in 2–5 s, the occupational therapist provided a general prompt. If the participant continued to make the error, the occupational therapist provided a more specific prompt. Additionally, the occupational therapist provided positive feedback when the participant corrected an error after a prompt.  
After completion of the task, the participants who were randomly assigned to the experiential group and the occupational therapist completed the MIRS separately and did not discuss their ratings with each other. |
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• Kitchen of participant’s home for participants in community rehabilitation |
| Who Delivered? | Three occupational therapists |
| How often? | Each participant completed four cooking tasks, with 2–4 days between tasks. Baseline measurements were taken at the first intervention session. Postintervention measurements were taken during the last session. |
| For how long? | Time required to prepare the meal |

**Intervention Biases:** Check yes, no, or NR and explain, if needed.

**Contamination:**

| YES ☐ | NO ☐ | NR ☒ |
| Comment: |

**Co-intervention:**

| YES ☐ | NO ☐ | NR ☒ |
| Comment: |

**Timing:**

| YES ☒ | NO ☐ | NR ☐ |
| Comment: The time between meal preparation tasks was inconsistent among participants. The study provided a range of 2–4 days between completed meal preparation tasks. |

**Site:**

| YES ☒ | NO ☐ | NR ☐ |
| Comment: Some participants completed the meal preparation task in the rehabilitation kitchen during inpatient rehabilitation. Some participants completed the meal preparation task in their kitchen at home. |

**Use of different therapists to provide intervention:**

| YES ☒ | NO ☐ | NR ☐ |
| Comment: Three occupational therapists were used during the study. They were all trained in each of the three feedback interventions. |

**MEASURES AND OUTCOMES**
Complete for each measure relevant to occupational therapy:

**Measure 1:**

| Name/type of measure used: | Counting the number of errors made during the meal preparation task |
| What outcome was measured? | Online awareness |
Is the measure reliable? | YES ☐ | NO ☐ | NR ☒
---|---|---|---
Is the measure valid? | YES ☐ | NO ☐ | NR ☒
When is the measure used? | Errors were counted after the completion of the meal preparation task. Assessors counted errors by watching the video of the task.

Measure 2:

Name/type of measure used: Awareness Questionnaire (AQ)
What outcome was measured? Intellectual awareness, including the physical, cognitive, and behavioral domains
Is the measure reliable? YES ☐ | NO ☐ | NR ☒
Is the measure valid? YES ☐ | NO ☐ | NR ☒
When is the measure used? Baseline and postintervention

Measure 3:

Name/type of measure used: Self-Perceptions in Rehabilitation Questionnaire
What outcome was measured? Self-perceptions on four scales: “changes in self and life plans, emotional reactions, self in rehabilitation, and perceptions of recovery and returning to normal” (p. 317)
Is the measure reliable? YES ☐ | NO ☐ | NR ☒
Is the measure valid? YES ☐ | NO ☐ | NR ☒
When is the measure used? Baseline and postintervention

Measurement Biases

Were the evaluators blind to treatment status? Check yes, no, or NR, and if no, explain.

YES ☒ | NO ☐ | NR ☐ Comment: A blinded assessor watched the video of the participants completing the task and counted the errors made.

Recall or memory bias. Check yes, no, or NR, and if yes, explain.

YES ☐ | NO ☐ | NR ☒ Comment:

RESULTS
List key findings based on study objectives
   Include statistical significance where appropriate (p<0.05)
   Include effect size if reported

- At postintervention, the video feedback group produced significantly fewer errors than the verbal feedback group and the experiential feedback group \((p < .001)\). Additionally, there was no significant difference in number of errors between the verbal and experiential feedback groups.
- The video feedback group scored significantly better at postintervention than both the verbal and the experiential group on the AQ measure of intellectual awareness \((p < .01)\). Additionally, there was no significant difference in AQ scores between the verbal and experiential feedback groups.
- There were no significant differences between any of the groups on postintervention Self-Perceptions in Rehabilitation Questionnaire scores.
- Furthermore, for each group, most participants completed four meal preparation tasks, and there were no statistically significant differences among groups concerning noncompliance of the interventions.

Was this study adequately powered (large enough to show a difference)? Check yes, no, or NR, and if no, explain.

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<td>Comment: The researchers completed a sample size calculation to come up with 54 participants to provide an 80% probability to detect a 30% reduction in errors.</td>
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Were appropriate analytic methods used? Check yes, no, or NR, and if no, explain.

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<td>Comment: The researchers used analyses of variance to calculate the difference among the means for the three groups.</td>
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Were statistics appropriately reported (in written or table format)? Check yes or no, and if no, explain.

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<td>Comment: The researchers provided a table to represent outcome scores at baseline and postintervention for each group.</td>
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Was the percent/number of subjects/participants who dropped out of the study reported?

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<tbody>
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Limitations:
What are the overall study limitations?
The researchers identified three main limitations to their study. First, when scoring intellectual awareness with AQ scores, the therapists were not blinded to the participant. Second, when the researchers assessed participants with neuropsychological tests, the Glasgow Coma Scale, and the Functional Independence Measure, they found differences among the groups, and some of the participants in the experiential group were more severely injured than the participants in the other two groups. Third, participants varied in length of time since injury, and researchers were unaware how that variation might relate to online awareness.

CONCLUSIONS
State the authors’ conclusions related to the research objectives.

The researchers concluded that among patients with TBI, video feedback with verbal feedback improved online awareness significantly more than just verbal feedback or experiential feedback alone. Additionally, they concluded that the video feedback group also produced significantly greater improvements in intellectual awareness than the verbal and experiential groups. Furthermore, when the researchers evaluated the effectiveness of the interventions on self-perceptions of rehabilitation and emotional distress, there were no significant differences among groups. The researchers suggested that further research is needed to help determine a specific number of sessions necessary to improve intellectual and online awareness, along with research on the impact of self-awareness on self-concept, role participation, and independence.

This work is based on the evidence-based literature review completed by Claire Rosen, OTS, and Kelly Erickson, PhD, OTR/L, Faculty Advisor, The College of Saint Scholastica.


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