Block number and predictor	Final beta	R-square added	Cumulative R-square
1.Age LOS Chronicity	0.250*** 0.012 - 0.043	0.068**	0.068**
2. Initiation	0.275***	0.213***	0.281***
3. Impaired awareness	0.196**	0.073***	0.355***
4. Fund of Information Attention/Concentration Novel Problem Solving Memory	0.167* 0.087 0.116 -0.082	0.043**	0.397***

*p < .05; ** p < .01; ***p < .001

Table 2: Prediction of participation T-score at discharge for behavior intensive participants.

model increasing the R^2 to its final level of .40, (adjusted R^2 = .369, F(4,192)=3.4, p<.01). Table 2 displays the beta weights, predictive contributions and cumulative R^2 for the model. An examination of the significant Beta weights with all predictors entered reveal that after controlling for age, initiation, impaired awareness, and fund of information made the greatest unique contributions to variance in Participation T-scores at discharge.

Discussion

The purpose of this research was to evaluate the effectiveness of post-hospital NBI rehabilitation and to identify those variables most important for achieving functional independence. A very positive finding of this study was that on average, participants realized meaningful reduction in disability from admission to discharge, thereby improving the capacity to function in the community. This is particularly noteworthy given the average chronicity of nearly 7 years. Nonetheless, participants demonstrated significant improvement on the MPAI-4 Abilities, Adjustment, and Participation T-scores from admission to discharge (mean LOS = 12.4 months). These findings offer a definitive answer to the first question posed in this study: post-hospital neurobehavioral intensive rehabilitation is effective in reducing functional disability following moderate to severe brain injury, even with chronically injured individuals with moderate to severe behavioral disorders.

The second purpose of this study was to identify those variables that have the greatest impact on functional outcome. Consistent with previous literature[11], age was a significant predictor of outcome in this study, accounting for 7% of the variance in participation T-scores at discharge specifically. Participants under the age of 50 had better functional outcomes than those over the age of 50, t(217)=2.8, p<.01. After controlling for age, admission MPAI-4 variables *initiation, impaired awareness, and fund of information* added an additional 32% to the prediction, with initiation alone accounting for 21% of the variance in participation T-scores. At a functional level, the crux of the behaviourally intensive group is the inability to initiate and inhibit responses effectively (Initiation item), a limited understanding of their behavioral impact on interactions with others (Impaired Awareness item), and an inability to learn from past behavior based on a fund of knowledge encased in experience (Fund of Information item). The combined effect of all three variables creates the greatest challenge when away from a structured milieu. Most residential programs are highly structured but application of skills can be limited due to behavior risks. As such, treatment programs may consider emphasizing Initiation, Self-Awareness, and Information Integration for new response formation as a way to help participants manage more effectively and independently in less structured home and community settings.

Conclusions

The results of the study demonstrated evidence that improvement can be achieved with behaviorally intensive brain injured adults even with an extensive length of time since injury. The primary MPAI-4 predictors of positive outcome were Initiation, Impaired Awareness, and Fund of Information. The results of this research may provide a systematic method to formulate focused intervention strategies. These strategies may further enhance recovery with treatment modeling, and improve cost efficiency, for chronic brain injured survivors exhibiting significant behavior disorders.

Limitations

As is typical with applied clinical research, a non-treatment control group would not be possible to establish a comparison of outcomes. Also, the current research intent was on demonstrating the variables that are characteristic with neurobehavioral intensive subjects that have significant impact on program outcome. Subsequent research would then focus on long-term durability of post-discharge outcomes and societal participation.

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