Dil, Konuşma ve Yutma Araştırmaları Dergisi (DKYAD)
Journal of Language, Speech and Swallowing Research
5(3), 2022

Araştırma Makalesi

Gönderim Tarihi: 06.09.2022
Kabul Tarihi: 05.12.2022

Communication Partner Intervention for Cognitive and Pragmatic Skills in Traumatic Brain Injury

Halil Tayyip Uysal[1], Mariam Kavakcı [2]

Abstract

Purpose: Patients with traumatic brain injury (TBI) may encounter problems in cognitive-communication and pragmatic skills. This study aimed to investigate the effects of communication partner intervention (CPI) on cognitive-pragmatic skills in a case with TBI. **Method**: A 22-year-old female case with TBI and the case's relative participated in the study. The case and her relative were assessed by using the Turkish versions of La Trobe Communication Questionnaire (LCQ-TR) and Montreal Cognitive Assessment Scale (MoCA-TR) along with subjective clinician evaluation at the third and sixth months following the incident. After the initial assessment, 14 strategies within the context of CPI were used over three sessions with the case's relative. **Results:** The scores of MoCA-TR test and LCQ-TR increased following CPI. There were differences between the scores obtained from two applications in both assessment tools which reflected a positive improvement related to communication skills. **Conclusion**: In a case with TBI, CPI can be effective in supporting cognitive and pragmatic skills in the short term.

Keywords: traumatic brain injury, social communication, cognitive communication, communication partner intervention.

Travmatik Beyin Hasarında Kognitif ve Pragmatik Beceriler için İletişim Partneri Müdahalesi

Özet

Amaç: Travmatik Beyin Hasarı (TBH) vakaları, başka bireylere bağımlı kalmaya neden olan sosyal, iletişimsel ve bilişsel bozukluklar gösterir (de Koning ve ark., 2015). Bu durum dili işlemede zorluklara neden olabilir ve sosyal açıdan uyumlu olmayan organizasyon ve davranışları ortaya çıkarabilir (Ylvisaker, 2001). Yeterli konuşma becerilerine sahip olmanın hafif TBH'li vakalarda bile zor olduğu tahmin edilmektedir (Tucker & Hanlon, 1998).

[1] Sorumlu Yazar, Araştırma Görevlisi, Ankara Yıldırım Beyazıt Üniversitesi, Dil ve Konuşma Terapisi Bölümü, htuysal@ybu.edu.tr, ORCID: 0000-0001-7758-0785
[2] Misafir Öğretim Görevlisi Doktor, Ankara Yıldırım Beyazıt Üniversitesi, Dil ve Konuşma Terapisi Bölümü, mariamkavakci@gmail.com, ORCID: 0000-0001-6511-9203
Bu makaleyi kaynak göstermek için/To cite this article: Uysal, H. T., &, Kavakcı, M. (2022). Communication partner intervention for cognitive and pragmatic skills in traumatic brain injury. *Dil, Konuşma ve Yutma Araştırmaları Dergisi, 5*(3), 254-273. https://doi.org/10.58563/dkyad-2022.53.2

Bu vaka çalışmasında TBH'li bir vakaya iletişim partneri müdahalesi (İPM) uygulanarak kognitif ve iletişim becerilerine etkilerinin incelenmesi hedeflenmektedir. **Yöntem**: Vaka (19 yaşında, kadın, sağ el dominant), Temmuz 2020'de araç içinde trafik kazası geçirmiştir. Kaza sırasında bilinç kaybı yaşanmamıştır. İlk muayenede, Glasgow Koma Skoru 9 olarak belirlenmiştir. Vaka raporunda kafatasında sağ temporal bölgede kırıklar olduğu; ancak sol hemisferde basınç nedeniyle daha fazla etkilenme olduğu not edilmiştir. Parietal, temporal ve oksipital lobların da etkilendiği bildirilmiş ve beynin tüm bölgelerinde kanayan odaklar olduğu belirtilmiştir. Ayrıca, vakada epidural hematom tespit edilmiştir. Bu bulgular dikkate alındığında vaka, Malec ve arkadaşlarının (2007) sınıflamasına göre orta-şiddetli TBH semptomlarını karşılamıştır. Vakanın disfaji değerlendirmesi ikinci araştırmacı tarafından videofloroskopik ve klinik yutma değerlendirmesi üzerinden gerçekleştirilmiştir. Değerlendirmede vakanın Uluslararası Diyet Standardizasyon Girişimi'nin tüm seviyelerinde beslenebileceği sonucuna varılmıştır. Kasım 2020'de vakaya Evre-1 değerlendirmesi yapılmıştır. Vaka, daha sonra Aralık 2020'de ikinci hastaneden taburcu edilmiştir. Vakanın bilişsel ve sosyal iletişim becerilerini değerlendirmeye yönelik prosedür, ilk olarak TBH olayından yaklaşık üç ay sonra Kasım 2020'de uygulanmıştır. Ardından vaka, İPM ile takibe alınmış ve bu süre içinde direkt tedavi uygulanmamıştır. Vaka, müdahalenin yapıldığı hastanenin bulunduğu şehirden farklı bir şehirde ikamet ettiğinden, bu süreç telefonla takip ve iletişim partneri tarafından önerilerin uygulanmasını içermiştir. Vaka, Evre-1'den yaklaşık bir ay sonra taburcu edilmiştir. İkinci değerlendirme, Evre-1'den yaklaşık üç ay sonra, Şubat 2021'de yapılmıştır. Vakanın değerlendirmesinde İletişim Algısı Ölçeği'nin Türkçe versiyonu (ing. "*La Trobe Communication Questionnaire-Turkish version*, LCQ-TR") ve Montreal Bilişsel Değerlendirme Ölçeği (MoCA-TR) kullanılmıştır (Kavakçı ve ark., 2021; Selekler ve ark., 2010). LCQ-TR hem vaka hem de vaka yakını tarafından pragmatik becerileri ölçmek amacıyla, MoCA-TR testi ise vakanın kognitif becerilerini değerlendirmek amacıyla kullanılmıştır. Ek olarak, seans içi gözlemlerde subjektif klinisyen değerlendirmesi yapılmıştır. Çalışma boyunca Evre-1'de ilk değerlendirme, Evre-2'de İPM, Evre-3'te vaka ve iletişim partnerinin etkileşimi, Evre-4'te ise takip değerlendirmesi yapılmıştır. TBH'li bireylerde iletişim partnerinin müdahalede yer alabileceği ve bireyin ilerleme kaydetmesinde önemli bir role sahip olabileceği belirtilmiştir (ASHA, 2020). Bu doğrultuda, Ek-2'de (Appendix-2) sunulan seans içerikleri ve stratejileri iletişim partneriyle üç seans boyunca çalışılmıştır. **Bulgular:** Bu çalışmada orta-ileri şiddetli TBH'li bir vakaya, doğrudan terapi olmadan, İPM'nin etkileri üç ay boyunca takip edilerek araştırılmıştır. Evre-1'de yapılan değerlendirme sonuçları Evre-4'te yapılan değerlendirme ile karşılaştırıldığında LCQ-TR ve MoCA-TR skorlarında düşüş olduğu görülmüştür. MoCA-TR testinin değerlerinin takip değerlendirmesinde normal ranjda olduğu görülmüştür. Değerlendirme araçlarından elde edilen skorlar göz önüne alındığında iletişim partnerine verilen önerilerin ve

stratejilerin iyileşmeye yardımcı olduğu söylenebilir. Bir diğer yandan spontan iyileşmenin de göz önünde bulundurulması gerekir. Verilen müdahalenin yanında spontan iyileşme vakanın kognitif ve pragmatik becerilerinde ilerlemeyi desteklemiş olabilir. **Sonuç**: Bu vaka raporunda orta-ileri şiddetli TBH'li bir bireyin sosyal ve kognitif iletişim becerilerinin doğrudan müdahale olmadan spontan iyileşme sürecinde desteklenebileceği gösterilmiştir. Ayrıca üç seanslık bir iletişim partneri sürecinin vakada olumlu değişimler oluşturabileceği bildirilmiştir. Bununla birlikte, vakanın iletişim partnerinin üniversite mezunu olması ve vakanın iş birliği sergilemesinin de müdahalenin uygulanmasını kolaylaştırdığı düşünülmektedir. Bireyselleştirilmiş İPM'nin, TBH'li bir vakanın sosyal ve kognitif iletişim becerilerini desteklediği belirtilebilir.

Anahtar Sözcükler: travmatik beyin hasarı, sosyal iletişim, kognitif iletişim, iletişim partneri müdahalesi.

Introduction

Traumatic Brain Injury (TBI) cases demonstrate social, communicational and cognitive impairments at variable levels that can result in dependence on others (de Koning et al., 2015). It is reported that cognitive and social communication problems can result in concerns regarding health as opposed to a state of wellness (Oyesanya et al., 2019). This condition may cause difficulties in language processing, organization and behaviors that are not socially relevant (Ylvisaker, 2001). It is predicted that possessing fully competent speech skills is quite challenging even in mild TBIs (Tucker & Hanlon, 1998).

Recent studies have developed interventions aimed at increasing the patients' social interactions directed to their communication partners and these have been reported to produce positive effects on individuals with aphasia and Alzheimer's disease. Given this information, cognitive and social communication interventions are thought to be important in TBI cases. In order to improve cognitive skills in TBI cases; interventions aimed at improving attention, memory (Galbiati et al., 2009), executive function (Raskin & Sohlberg, 2009), and conversational discourse (Snow et al., 1998) can be performed. Some of the social communication interventions applied to the TBI patients include social skills intervention (Spikman et al., 2010), interactive group intervention for social skills (Ownsworth et al., 2000) and pragmatic skills intervention (Dahlberg et al., 2007). Moreover, TBI case reports in the literature include longitudinal follow-up studies targeting communication (Goldblum et al., 2001), longitudinal assessment of language and communication skills during post-traumatic amnesia (Whelan et al., 2007), environmental intervention using assistive technology (Steel et al., 2017).

This study aims to report the assessment results related to the cognitive and social communication skills of a case with TBI with direct contribution from the case's relative and the speech and language therapist (SLT). In this way, the SLT can compare and combine the

information about the case's communication from different views. It is aimed to teach the communication strategies to the case's relative. It is assumed that these strategies might help to improve cognitive and pragmatic skills of the case. Any possible improvements related to the communication skills would be investigated through the assessments at the beginning and at the end of the intervention. The research questions of this study are as follows:

1. Would there be an improvement in cognitive and social communication skills of the case as a result of communication partner intervention (CPI) in the post-Moderate/Severe-TBI recovery period?

2. Would perceived communication improvement of the case be comparable between the case and the case's relative in the post-Moderate/Severe-TBI recovery period?

Method

This study was conducted compatible with the Consensus-based Clinical Case Reporting Guideline Development (CARE) (see Appendix-1). The ethical approval was obtained from the Ankara Yildirim Beyazit University's Ethical Review Board.

Case Presentation

The case (19-year-old, female, right-handed) had a traffic accident inside the vehicle in July 2020. She did not experience any loss of consciousness during the accident. On initial examination, the Glasgow Coma score was specified as 9. The case's report described fractures in the skull in the right temporal region; however, the left hemisphere was more impacted due to the pressure. It was reported that parietal, temporal and occipital lobes were affected. It was also stated that there were bleeding branches/foci in all regions of the brain. In addition, the case was found to have epidural hematoma. Considering these findings, the case met the symptoms of Moderate/Severe-TBI according to the classification of Malec et al. (2007) (see Table 1). After the incident, the case was hospitalized in the intensive care unit of Ankara

Training and Research Hospital for a month. During this one-month period, nutrition was provided via a nasogastric tube (NG). A tracheostomy was performed on the twentieth day of this period, and it was closed five days later as the respiratory problem disappeared. Following the one-month-long hospitalization in the specified hospital, the case then received treatment in Ankara City's Hospital for three months and ten days. In this hospital, the Glasgow Coma Scale score of the case was determined as 13. In the first month of this treatment, the case received nutrition via a Percutaneous Endoscopic Gastrostomy (PEG) tube. The case's condition in terms of dysphagia was assessed by the second researcher through videofluoroscopic and clinical swallowing evaluation. After evaluation it was concluded that the case could be fed at all levels of the Dysphagia Diet Standardization Initiative (IDDSI). In November 2020, the case underwent the stage-1 assessment. She was then discharged from the second hospital in December 2020. The case was accompanied by her mother during all of these stages. The medications and their usage duration were reported by the mother as specified below (see Table 1).

Table 1

Demographic Information of the Case and Communication Partner

	Age	Gender	Education	TBI Findings	Medications(period)
Patient	19	Female	High School	Epidural Hematoma	Kepra 500 (6 Mo.), Clexan 4000 (6 Mo.), Gastrofem 40 (5 Mo.), Neurooptimizer (3 Mo.), Senelac 25 (5 Mo.)
Caregiver	49	Female	Undergraduate	-	-

(TBI: Traumatic Brain Injury, Mo.: Months)

Data Collection Tools

La Trobe Communication Questionnaire (LCQ)

LCQ aims to evaluate the perception of communication, communication skills and, in this context, social communication and pragmatic skills of individuals with TBI and their relatives. The LCQ scale consists of two forms including LCQ-Self Report (LCQ-S) and LCQ-

Other/Relative (LCQ-O). The LCQ-S form is completed directly by individuals with TBI, whereas the LCQ-O form is completed by their relatives based on the communicational state of the individuals with TBI. Both forms consist of thirty items and the minimum and maximum scores that can be obtained are specified as 30 and 120, respectively. While high scores on the scale indicate an unfavorable state, low scores indicate a favorable state (Douglas et al., 2000). The preliminary study regarding the Turkish adaptation of LCQ (LCQ-TR) was conducted by Kavakci et al. (2021), indicating that LCQ-TR is a valid and reliable tool.

Montreal Cognitive Assessment (MoCA)

MoCA is a screening tool assessing different cognitive domains including visuo-spatial skills, executive functions, naming, attention, language, abstraction, delayed recall and orientation with a maximum total score of 30. It can be administered approximately in ten minutes (Nasreddine et al., 2005). The Turkish version of MoCA (MoCA-TR) was formed by Selekler et al. (2010), reporting it to be valid and reliable.

Subjective Clinician Assessment

In addition to the standard assessment, subjective clinician assessment was administered, as well. This was due to the fact that SLT's observations and decisions regarding the optimum therapeutic approach might provide important information about the case. This is also based on the naturalistic observation stage that is part of the observational assessment recommended by the American Speech-Language-Hearing Association (ASHA, n.d.). The SLT recorded the skills specified for this interview by interpreting them as inadequate-moderate-adequate at the end of the interview. In the context of the subjective assessment; primarily, the case's skills of initiating-ending communication, introducing oneself, orientation to the environment and their situation, establishing eye contact and using gestures and mimics, attending to the partner during conversation, comprehending the questions and responding to

them appropriately, following instructions and establishing appropriate communication with the case's relative were observed.

Procedures

The procedure aimed at assessing the cognitive and social communication skills of the case was firstly administered in November 2020, approximately three months after the TBI incident. Subsequently, the case did not receive any direct therapy during this period. The case was followed-up with a CPI. Since the case resided in a different city other than Ankara, this process included follow-up by telephone and implementation of the suggestions given by the SLT to the case's relative. The case was discharged approximately one month after Stage-1. The second assessment was conducted approximately three months after Stage-1 in February 2021. The details about these stages were given in the following section.

Results

Stage-1 (Assessment)

At this stage, we conducted LCQ-TR and MoCA-TR as part of standard assessment and subjective assessment to have more detailed information about the case's communication skills. The case was evaluated face-to-face by the first researcher in November 2020 in Ankara City's Hospital. Firstly, the case's cooperation was assessed through conversation. Subsequently, the case completed LCQ-TR-S while the relative was outside of the room. Then, the case's relative completed the LCQ-TR-O scale based on the case's ability (see Table 2). During this process, the SLT did not offer any instructions to the case or the case's relative. After the completion of the LCQ-TR, we proceeded to apply MoCA-TR for the cognitive assessment by following the instructions for administration (see Table 3). Following the standard assessment, a group conversation was held by the SLT, case and the case's relative in order to observe the predetermined target skills in the subjective clinician assessment. The topics for the

conversation included the case's temperament and her personal characteristics. The conversation continued with the daily subjects such as the previous vacations/travels of the case with her family and friends, foods that the she enjoyed, books that she read, games she played with her mother at the hospital, treatments she received at the hospital.

Table 2

LCQ-TR Scores of Stage 1 and Stage 4

	Stage 1		**Stage 4**	
LCQ-TR Subscales	Patient	C.P.	Patient	C.P.
Quantity	11/16	9/16	9/16	7/16
Quality	8/12	7/12	4/12	4/12
Relation	9/20	11/20	8/20	6/20
Manner	13/32	18/32	11/32	11/32
Cognitive Constructs	17/36	21/36	12/36	17/36
LCQ-TR - Total	58/120	69/120	47/120	46/120

(C.P.: Communication Partner, LCQ-TR: Turkish version of La Trobe Communication Questionnaire)

Table 3

MoCA-TR Scores of Stage 1 and Stage 4

	Stage 1	**Stage 4**
MoCA-TR Subscales	Patient	Patient
Visual Spatial / Executive Function	3	5
Naming	0	3
Attention	3	6
Language	2	3
Abstraction	1	1
Recall Memory	0	1
Orientation	3	6
MoCA-TR - Total	12/30	25/30

(MoCA-TR: Turkish version of Montreal Cognitive Assessment)

Observations from Subjective Clinician Assessment

The skills of initiating-ending communication were evaluated as moderate. The case did not exhibit an appropriate greeting skill in the beginning of the interview. She was able to initiate the necessary communication by the insistence of the case's relative. Meanwhile, she was able to end communication appropriately at the end of the interview. The case was able to introduce herself at an adequate level by providing her name and surname. A moderate level of adequacy was observed in the case's skills of orientation to the present environment and the situation. Also, the symptoms of agitation were observed among the case and her relative. The skills of establishing eye contact and using gestures and mimics were recorded as moderate-level due to occasionally averting her eyes and using inappropriate gestures-mimics during speech. Regarding the skill of attending to the conversation with partner, the case was mostly able to follow the clinician. The skills of understanding questions, responding appropriately, and following instructions were considered as moderate as the case requested some questions to be repeated and provided inappropriate responses. Lastly, during the group conversation, the SLT observed the conversation of the case with the relative and recorded communication as adequate. However, it was observed that the relative behaved in a way to insist the case to communicate.

Stage-2 (CPI)

In the CPI used in this study, the case's relative received CPI for three sessions. During this process, it was explained to the case's relative how she could support the cognitive and social skills of the case. The strategies selected for the CPI were based on MoCA-TR, LCQ-TR and subjective clinician assessment. The case's relative discussed all methods with the SLT over three sessions (each session lasting approximately 30-40 min) and the intervention process was continued by the relative accordingly. In the context of the CPI, a total of 14 strategies and

activities were explained to the case's relative. During this process, methods such as role playing between the SLT and the case's relative were used as described by Ylvisaker et al. (1993). The strategies provided to the case's relative as part of the CPI were described through the session in the Appendix-2.

Stage-3 (Interaction between the Case and Partner During Communication)

At this stage, the case and the case's relative did not receive any intervention. It was aimed that the case and her relative would sustain interaction for three months in order to see the effects of the CPI applied previously. The case's relative was informed that she could contact the researchers to ask questions regarding any matter and to revise the strategies.

Stage-4 (Follow-up Assessment)

The case stayed at home with her family for a three-month period throughout Stage-3. During this period, it was reported that the case got infected with Coronavirus disease (COVID-19) after being discharged from the hospital in December 2020. It was reported that she received routine COVID-19 treatment and medications in this period. However, no complications occurred, and it was only reported that her fever ranged between 37-38 degrees in the first week following a positive Polymerase Chain Reaction test. The case recovered from COVID-19 at the end of 14 days. After the interval of 45 days with no physiotherapy sessions, the case began to receive physiotherapy again. The case did not receive psychotherapy and/or speech and language therapy during this period. It was reported that the case had marked as having difficulty in reading and speech up to two months before Stage-4. However, she could read relatively longer story books more recently. It was reported that the case was able to attend daily activities (attending physiotherapy sessions, going to the market) by herself in the recent weeks.

The assessment sessions performed at this stage were conducted online over the ZOOM software as the case resided in another city. Since the case was undergoing a tele-intervention for the first time, a conversation was held to observe the case's cooperation and inspections were made to ensure a healthy communication. Then, for the administration of LCQ-TR-S, it was ensured that the procedure was conducted while the case was alone. The relative completed the LCQ-TR-S scale through the same procedure (see Table 2). After the completion of the LCQ scale, we proceeded to administer the MoCA-TR for cognitive assessment. The case obtained the materials required to complete MoCA-TR which was administered to the case by following the scale's instructions. Thus, the assessment sessions were completed (see Table 3). Regarding the sections of the MoCA-TR, the memory section showed that the case had good short-term memory. However, it was noted by the SLT in the following parts of the test that the case could not demonstrate adequate long-term memory skills. In the long-term memory section, the case could not recall any of the words she was expected to remember without receiving clues. She demonstrated the ability to recall two words: One word with a clue and one word with a clue and options. In support of this result, the case's relative reported that the case experienced problems regarding long-term memory. The subjective clinician assessment related to the skills of initiating-ending communication was evaluated as adequate as she exhibited appropriate greeting behavior. The case was able to demonstrate the skill of introducing herself at an adequate level by providing her name, surname and age. Improvements were observed in the case's skills of orientation to the present environment and situation (her home, city etc.) and these skills were evaluated as adequate. It was thought that the case and her relative still expected that their situation would return to completely normal. Meanwhile, the skills of establishing eye contact and using gestures and mimics were observed to be adequate. Regarding the skill of attending to the conversation partner, the case was mostly able to follow the clinician. The skills of understanding the questions, responding to these questions

appropriately, and following instructions were considered as adequate as the case could provide appropriate responses to almost all of the questions. Lastly, during group conversation, the SLT observed the conversation of the case with the relative and recorded that her communication with the relative was mainly adequate. The initial assessment conducted at Stage-1 and the second assessment conducted at Stage-4 demonstrated a marked decrease in the scores pertaining to LCQ-TR-S and LCQ-TR-O. Furthermore, it can be stated that the second assessment is more favorable regarding the compatibility between the LCQ-TR-S and LCQ-TR-O scores. It can be expressed that the MoCA-TR scores obtained from the case in order to evaluate cognitive skills showed a marked increase. Accordingly, as shown in Table 3, the case showed improvement in the following areas: Visual-spatial skills/executive function, naming, attention, language, delayed recall and orientation. Similarly, there was an increase in the LCQ-TR scores related to quantity, quality, relation, manner, cognitive constructs at the final stage.

Discussion

This study investigated the effects of CPI on a case with Moderate/Severe-TBI without providing direct therapy over a three-month period. MoCA-TR results approached normal values when the cognitive skills of the case were evaluated after a three-month interval (see Table 3). Therefore, it can be associated with both the CPI and spontaneous recovery. At this point, it can be stated that providing recommendations to the case is effective after considering the relevant sections of the tests used in the assessment.

In this study, the outcomes of the case during a total period of six months after Moderate/Severe-TBI diagnosis provided evidence that the prognosis may not always deteriorate (particularly, in the cognitive and social communication contexts), which differed from previous research (Struchen et al., 2011). Given the results of the study, it is observed that the CPI can be delivered over a brief period of time spanning three sessions and could be based

on a combination of standard and non-standard assessment. Since other CPIs last longer, this intervention is thought to be more effective in terms of time. It is thought that the case was better at self-monitoring with the trend of improvement in orientation skills, social communication level and cognitive skills.

This study supports the administration of cognitive and communicational assessment in the three-month period following TBI. Based on the evaluation (along with clinician observation), this study corroborates the notion that spontaneous recovery and CPI can produce favorable outcomes in the long term. In agreement with the literature, this study also showed that CPI is important during the spontaneous recovery period (O'Neil-Pirozzi et al., 2010). This study demonstrated that cognitive and social communication skills can be supported by delivering a case-specific CPI after TBI.

References

American Speech Language Hearing Association (2020). Cognitive-communication referral guidelines for adults. https://www.asha.org/slp/cognitive-referral/

American Speech Language Hearing Association. (n.d.). Assessment tools, techniques, and data sources. https://www.asha.org/practice-portal/clinical-topics/late-language-emergence/assessment-tools-techniques-and-data-sources/

Dahlberg, C. A., Cusick, C. P., Hawley, L. A., Newman, J. K., Morey, C. E., Harrison-Felix, C. L. & Whiteneck, G. G. (2007). Treatment efficacy of social communication skills training after traumatic brain injury: a randomized treatment and deferred treatment-controlled trial, *Archives of Physical Medicine and Rehabilitation*, *88*, 1561-73. https://doi.org/10.1016/j.apmr.2007.07.033

de Koning, M. E., Spikman, J. M., Coers, A., Schönherr, C. M. & van der Naalt, J. (2015) Pathways of care the first year after moderate and severe traumatic brain injury—Discharge destinations and outpatient follow-up, *Brain Injury*, 29, 423-29. https://doi.org/10.3109/02699052.2014.982188

Douglas, J. M., O'Flaherty, C. A. & Snow, P. C. (2000). Measuring perception of communicative ability: The development and evaluation of the La Trobe Communication Questionnaire, *Aphasiology*, *14*, 251-68. https://doi.org/10.1080/026870300401469

Galbiati, S., Recla, M., Pastore, V., Liscio, M., Bardoni, A., Castelli, E. & Strazzer, S. (2009). Attention remediation following traumatic brain injury in childhood and adolescence, *Neuropsychology*, *23*(1), 40-49. https://psycnet.apa.org/doi/10.1037/a0013409

Goldblum, G., Mulder, M. & von Gruenewaldt, A. (2001). An examination of the impact of participation in a conversation group for individuals with a closed head injury, *South African Journal of Communication Disorders*, *48*, 3-20.

Kavakci, M., Uysal, H. T., Köse, A. & Saatçioğlu, Ö. (2021). Reliability – validity and cultural adaptation of the La Trobe Communication Questionnaire in Turkish (LCQ-TR): Preliminary Findings, *14th Panhellenic – 1st International Congress of Speech and Language Therapists, Athens, Greece*, 28 - 30 May 2021.

Malec, J. F., Brown, A. W., Leibson, C. L., Flaada, J. T., Mandrekar, J. N., Diehl, N. N. & Perkins, P. K. (2007). The mayo classification system for traumatic brain injury severity, *Journal of Neurotrauma*, *24*, 1417-24. https://doi.org/10.1089/neu.2006.0245

Nasreddine, Z. S., Phillips, N.A., Bédirian, V., Charbonneau, S., Whitehead, V., Collin, I., Cummings, J. L. & Chertkow, H. (2005). The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment, *Journal of the American Geriatrics Society*, *53*, 695-99. https://doi.org/10.1111/j.1532-5415.2005.53221.x

O'Neil-Pirozzi, T. M., Strangman, G. E., Goldstein, R., Katz, D. I., Savage, C. R., Kelkar, K., Supelana, C., Burke, D., Rauch, S. L. & Glenn, B. (2010). A controlled treatment study of internal memory strategies (I-MEMS) following traumatic brain injury, *The Journal of Head Trauma Rehabilitation*, *25*(1), 43-51. https://doi.org/10.1097/htr.0b013e3181bf24b1

Ownsworth, T. L., McFarland, K. & Mc Young, R., (2000). Self-awareness and psychosocial functioning following acquired brain injury: An evaluation of a group support programme, *Neuropsychological Rehabilitation*, *10*(5), 465-84. https://doi.org/10.1080/09602010050143559

Oyesanya, T. O., Arulselvam, K., Thompson, N., Norelli, J. & Seel, R. T. (2021). Health, wellness, and safety concerns of persons with moderate-to-severe traumatic brain injury and their family caregivers: a qualitative content analysis, *Disability and Rehabilitation*, 43(5), 685-695. https://doi.org/10.1080/09638288.2019.1638456

Raskin, S. A., & Sohlberg, M. M. (2009). Prospective memory intervention: A review and evaluation of a pilot restorative intervention, *Brain Impairment*, *10*(1), 76-86. doi:10.1375/brim.10.1.76

Selekler, K., Cangöz, B. & Ulus, S. (2010). Power of discrimination of Montreal Cognitive Assessment (MOCA) Scale in Turkish patients with mild cognitive impairment and Alzheimer's disease. *Turkish Journal of Geriatrics*, *13*(3), 166-171.

Snow, P., Douglas, J. & Ponsford, J. (1998). Conversational discourse abilities following severe traumatic brain injury: A follow up study. *Brain Injury*, *12*(11), 911-935. https://doi.org/10.1080/026990598121981

Spikman, J. M, Boelen, D. H., Lamberts, K. F., Brouwer, W. H. & Fasotti, L. (2010). Effects of a multifaceted treatment program for executive dysfunction after acquired brain injury on indications of executive functioning in daily life, *Journal of the International Neuropsychological Society*, *16*(1), 118-29. https://doi.org/10.1017/s1355617709991020

Steel, J., Ferguson, A., Spencer, E. & Togher, L. (2017). Language and cognitive communication disorder during post-traumatic amnesia: Profiles of recovery after TBI from three cases, *Brain Injury*, *31*(13-14), 1889-902. https://doi.org/10.1080/02699052.2017.1373200

Struchen, M. A., Pappadis, M. R., Sander, A. M., Burrows, C. S., & Myszka, K. A. (2011). Examining the contribution of social communication abilities and affective/behavioral functioning to social integration outcomes for adults with traumatic brain injury, *The Journal of Head Trauma Rehabilitation*, *26*(1), 30-42. https://doi.org/10.1097/htr.0b013e3182048f7c

Tucker, F. M., & Hanlon, R. E. (1998). Effects of mild traumatic brain injury on narrative discourse production, *Brain Injury*, *12*(9), 783-92. https://doi.org/10.1080/026990598122179

Whelan, B. M., Murdoch, B. E. & Bellamy, N. (2007). Delineating communication impairments associated with mild traumatic brain injury: A case report, *The Journal of Head Trauma Rehabilitation*, *22*(3), 192-97. https://doi.org/10.1097/01.htr.0000271120.04405.db

Ylvisaker, M. (2001). Communication disorders associated with traumatic brain injury. In R. Chapey (Eds.), *Language intervention strategies in aphasia and related neurologic communication disorders* (pp.745-807). Lippincott Williams & Wilkins.

Ylvisaker, M., Feeney, T. J. & Urbanczyk, B. (1993). A social-environmental approach to communication and behavior after traumatic brain injury. *Seminars in Speech and Language*, *14*(1), 74-87. https://doi.org/10.1055/s-2008-1064160

Etik Kurul İzni: Ankara Yıldırım Beyazıt Üniversitesi Etik Kurulu'ndan 15.03.2021 tarih ve 44 sayılı onayı ile izin alınmıştır.

Yazar Katkıları/Author Contributions: Halil Tayyip Uysal: Conceptualization, Visualization/Methodology, Administration/Supervision, Data Collection and Processing, Analysis/Interpretation, Literature Review, Writing, Critical Review, Provision of Funding and Other Resources, Materials; **Mariam Kavakci**: Conceptualization, Visualization/Methodology, Analysis/Interpretation, Literature Review, Writing, Critical Review, Provision of Funding and Other Resources, Materials.

Çıkar Çatışması/Conflict of Interest: Yazarlar makalenin hazırlanması ve basımı esnasında hiçbir kimse veya kurum ile çıkar çatışması içinde olmadıklarını beyan etmişlerdir. / The authors have declared that no conflict of interest existed with any parties at the time of publication.

Appendix

Appendix-1. CARE Checklist

CARE case report guidelines

CARE Checklist of information to include when writing a case report

Topic	Item	Checklist item description	Reported on Line
Title	1	The diagnosis or intervention of primary focus followed by the words "case report"	Page
Key Words	2	2 to 5 key words that identify diagnoses or interventions in this case report, including "case report"	Abstract
Abstract (no references)	3a	Introduction: What is unique about this case and what does it add to the scientific literature?	Abstract
	3b	Main symptoms and/or important clinical findings	Abstract
	3c	The main diagnoses, therapeutic interventions, and outcomes	Abstract
	3d	Conclusion—What is the main "take-away" lesson(s) from this case?	Abstract
Introduction	4	One or two paragraphs summarizing why this case is unique (**may include references**)	Page 257-258
Patient Information	5a	De-identified patient specific information.	Page 258-259
	5b	Primary concerns and symptoms of the patient.	Page 258-259
	5c	Medical, family, and psycho-social history including relevant genetic information	Page 258-259
	5d	Relevant past interventions with outcomes	Page 259
Clinical Findings	6	Describe significant physical examination (PE) and important clinical findings.	Page 259
Timeline	7	Historical and current information from this episode of care organized as a timeline	Page 258-259
Diagnostic Assessment	8a	Diagnostic testing (such as PE, laboratory testing, imaging, surveys).	Page 258-261
	8b	Diagnostic challenges (such as access to testing, financial, or cultural)	Page 258-261
	8c	Diagnosis (including other diagnoses considered)	Page 258-261
	8d	Prognosis (such as staging in oncology) where applicable	Page 258-261
Therapeutic Intervention	9a	Types of therapeutic intervention (such as pharmacologic, surgical, preventive, self-care)	Page 263
	9b	Administration of therapeutic intervention (such as dosage, strength, duration)	Page 261-266
	9c	Changes in therapeutic intervention (with rationale)	Page 261-266
Follow-up and Outcomes	10a	Clinician and patient-assessed outcomes (if available)	Page 261-266
	10b	Important follow-up diagnostic and other test results	Page 264-266
	10c	Intervention adherence and tolerability (How was this assessed?)	N/A
	10d	Adverse and unanticipated events	N/A
Discussion	11a	A scientific discussion of the strengths AND limitations associated with this case report	Page 266-267
	11b	Discussion of the relevant medical literature **with references**.	Page 266-269
	11c	The scientific rationale for any conclusions (including assessment of possible causes)	Page 266-267
	11d	The primary "take-away" lessons of this case report (without references) in a one paragraph conclusion	Page 267
Patient Perspective	12	The patient should share their perspective in one to two paragraphs on the treatment(s) they received	N/A
Informed Consent	13	Did the patient give informed consent? Please provide if requested	**Yes** ☑ **No** ☐

Appendix-2. Communication Partner Intervention

Cognitive - Social Communication Strategies and Activity Suggestions

Session 1

1. Strategy: Instruct the patient to copy certain shapes onto another empty piece of paper. As the shapes to be copied, pick a simple circle in the beginning and increase the task difficulty as the patient accomplishes the task. After copying the shapes, ask them to write letters or numbers around the corners of the shapes if the shapes are angular. If not angular, you can ask them to write numbers and letters in a manner that follows the arc. *Activity*: Try copying objects that the patient likes (e.g. copying the shape of a book or a meal in a simple manner). Letters and numbers written around the corners of the shapes should be connected in the end. (This strategy and this activity are based upon the spatial skills and executive function section of the MoCA-TR).

2. Strategy: Using books or cards, frequently repeat the names of the objects and actions you encounter in your daily life. *Activity*: While looking at the books/cards, first, say the name of an object you see, and then, on the next page/card, use gestures to indicate that it is the patient's turn. If the patient does not respond, lead this process with the use of clues. You can support naming by providing categoric clues first and phonetic clues later. (This strategy and activity are based upon the naming section of the MoCA-TR and the subjective clinician assessment).

3. Strategy: For attention skills, firstly count forward by starting from a number range the patient feels comfortable with and, when the patient succeeds, count backwards; if the patient accomplishes this as well, skip counting backwards. *Activity*: Start the activity from the numbers 0-20. If the patients succeeds in this range, you can continue the activity by increasing the range by twenty. (This strategy and activity are based upon the attention section of the MoCA-TR and the subjective clinician assessment).

4. Strategy: In order to support delayed recall, support the memory skill starting from a short duration and progress to longer periods. *Activity*: First, by saying that you forget the expression in the beginning of the sentence you have just finished and cannot remember it, encourage the patient to remember it. Gradually increase the time interval, modifying it to remember the name of the treatment they attended in the morning, the meal they had yesterday, the visitor from last week, etc. (This strategy and activity are based upon the delayed recall section of the MoCA-TR and the subjective clinician assessment).

5. Strategy: Establish daily routines to ensure orientation to the present environment, date and year. *Activity*: During the first week of this strategy, state the date in the order of day/month/year every day, repeatedly state the present environment, the treatments they have received. When you advance to the second week, you can start tracking each day in order and allow the patient to take turns in the routine. (This strategy and activity are based upon the orientation section of the MoCA-TR and the subjective clinician assessment).

Session 2

1. Strategy: While talking about the same subject, try switching the topic to another one of the patient's interests. Continue your conversation on a new activity. *Activity*: You can try changing the materials or the structure of the game when you focus on the same subject while conversing during the activity. (This strategy and activity are based upon the 3rd item of LCQ-TR.)

2. Strategy: When monitoring group conversations, inform the person who would like to communicate with the patient: Make sure that they speak slowly and wait while the patient is responding. *Activity*: Include another person

in your board games (e.g. memory cards) and make sure that they practice the strategy (This strategy and activity are based upon the 13th item of LCQ-TR).

3. Strategy: When the patient gives contextually irrelevant responses to your questions, support them with clues. *Activity*: While playing with picture sequencing cards, if the response you receive to your question as to what the next picture could be is not appropriate or if you feel the patient is having difficulty, generate a clue about the next card (e.g. categoric clue). (This strategy and activity are based upon the 20th item of LCQ-TR and the subjective clinician assessment).

4. Strategy: Wait longer when it is the patient's turn to speak. Even if you understand what they want, give them a chance to respond and think. *Activity*: Act as a good communicator while you are viewing picture books together. Do not narrate all of the pictures yourself; as you turn the pages one by one, assign one page to yourself and one page to the patient. During this process, practice the strategy described above. (This strategy and activity are based upon the 25th item of LCQ-TR and the subjective clinician assessment.)

5. Strategy: Try to reduce background noise as you speak with the patient. *Activity*: Turn the TV off while you are speaking with the patient. Make sure that other people in the room are not talking among themselves. You can try keeping the window and the door closed unless required otherwise (This strategy and activity are based upon the 29th item of LCQ-TR.)

6. Strategy: If the patient cannot hold a conversation due to their medical condition at times (e.g. feeling tired, unhappy, agitated or pain), do not insist them to communicate. *Activity*: In such situations, make use of your free time by taking time for yourself, as well. Also, you can describe your own day and activities without expecting an answer. Even just hearing appropriate words and sentences would support their communication. (This strategy and activity are based on the subjective clinician assessment.)

Session 3

1. Strategy: For initiating and ending the communication, provide clues first and then encourage the patient. *Activity*: Tell the patient that they can greet the doctor while visiting the room with expressions such as hello, have a nice day, see you soon. Then, rehearse. You can say, "I will enter the room as the doctor and you can respond to me". (This strategy and activity are based upon the 18th item of LCQ-TR and the subjective clinician assessment.)

2. Strategy: As the patient communicates, make their gestures-mimics (pointing with hand, moving eyes to a different direction, smiling, facial expressions such as surprise) meaningful and support them. *Activity*: Start the

interaction by making use of card games that include various gestures-mimics, moods. (This strategy and activity are based on the subjective clinician assessment).

3. Strategy: Allow the patient to perform certain daily-life activities independently once you are outside of the hospital room or discharged. *Activity*: Allow the patient to shop from the snack bar while out for a walk. (This strategy and activity are based upon the 25th item of LCQ-TR and the subjective clinician assessment.)