Readiness for hospital discharge perceived by caregivers of patients with traumatic brain injury: A cross-sectional study

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Abstract

Background: There is a growing emphasis on evaluating discharge readiness, particularly for those involved in the care of patients in transition. Caregivers supporting individuals with traumatic brain injury are a specific focus due to the potential impact of adequate discharge preparation on patient recovery and post-discharge outcomes.

Objective: This research aimed to evaluate the preparedness of caregivers for the discharge of patients with moderate or severe traumatic brain injury from the hospital.

Methods: This cross-sectional study was carried out in a tertiary hospital in Indonesia from January to April 2023 using the Indonesian adaptation of the Preparedness for Caregiving Scale. The study comprised seventy-four caregivers of individuals with traumatic brain injury, chosen through a purposive sampling approach based on pre-established inclusion and exclusion criteria. Data collection involved a questionnaire covering caregiver information (gender, age, education level, income, and psychological status) and discharge readiness. Descriptive statistics and correlation analyses, employing Pearson and chi-square, were conducted.

Results: Most caregivers were female (83.8%), spouses of patients (50%), and had a moderate education level (52.7%). The average age of caregivers was 43.7 ± 8.7 years, with an average duration of patient care of 4.22 ± 1.2 days and a monthly income of 220 US dollars. The mean score for readiness for hospital discharge was low (10.08 ± 1.91), indicating that caregivers were not adequately prepared for discharge. Age and education were significant factors ($p < 0.05$) related to hospital discharge readiness.

Conclusion: This study emphasizes the importance of assessing caregiver readiness for the discharge of patients with traumatic brain injury from the hospital. Findings indicate a concerning trend of inadequate preparedness among caregivers, with factors such as age and education level significantly influencing readiness. The predominance of female caregivers, often spouses of patients, indicates the need for tailored support strategies. Prioritizing caregiver preparation and support, especially by nurses, is crucial for optimizing patient recovery and post-discharge outcomes.

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Keywords

caregivers, patients, readiness for hospital discharge, traumatic brain injury

Background

Survivors of traumatic brain injury (TBI) often experience persistent symptoms, necessitating careful planning and support during the transition from hospital to home. Individuals with moderate and severe TBI commonly face issues such as long-term neurocognitive deficits, neurobehavioral sequelae, somatoform disorders, cognitive deficits, neuroendocrine dysfunction, and psychiatric disorders, all of which require ongoing treatment (Vos & Diaz-Arrastia, 2015). A study conducted on TBI patients in a referral hospital in West Java, Indonesia, revealed that many individuals with TBI continue to grapple with quality-of-life challenges, such as headaches, limited mobility, and difficulties in daily activities (McAllister et al., 2018). The study also indicated a high prevalence of

psychological disorders like anxiety and stress following discharge from the hospital. As a result, the transition of care for individuals with TBI requires assistance, oversight, or alternative care measures not only during their hospital stay but also in the subsequent months or even years following the injury (Powell et al., 2017). Planning for discharge and future care, particularly addressing the caregiver's role in caring for TBI patients, poses challenges that require thorough preparation and appropriate long-term care.

Existing literature highlights the critical role of the discharge planning program in determining the long-term outcomes for survivors of TBI (Pavlovic et al., 2019). This includes a comprehensive rehabilitation program incorporating occupational therapy, rehabilitation therapy, recreational therapy, speech therapy, nursing rehabilitation, and case

management. This multifaceted approach is anticipated to enhance the quality of life for individuals post-treatment (Pavlovic et al., 2019). An effectively implemented discharge planning program has the potential to improve both the readiness for hospital discharge and the patient's quality of life following hospitalization (Andrew et al., 2018).

The readiness for hospital discharge includes a condition and a progression marked by both physical well-being and mental readiness. Physical stability entails the capacity to handle self-care at home independently, supported by the necessary assistance to cope with post-hospitalization challenges. Psychological preparedness involves the application of effective strategies equipped with ample information and knowledge to address typical issues (Galvin et al., 2017). The lack of support from caregivers at home serves as an impediment to achieving readiness for discharge. Furthermore, disparities in discharge preparedness tend to grow with advancing age (Coffey & McCarthy, 2013). Weiss et al. (2011) also found that nurses' assessment of low discharge readiness was associated with an increased risk of readmission.

In the Indonesian healthcare system, patients with moderate and severe head injuries typically undergo hospital treatment for around 10 to 14 days. A discharge plan is formulated once the neurosurgeon declares the patient stable and ready for discharge. However, patients with moderate and severe head injuries may not recover as quickly as anticipated, often returning home with various conditions such as limited mobility, tracheostomy, nasogastric tube, and urinary catheter, necessitating home treatment (Faried et al., 2017). Therefore, it is crucial for nurses to conduct a thorough assessment and preparation for discharge readiness.

Assessing readiness for hospital discharge is paramount for ensuring safety, satisfaction, and positive outcomes for patients and caregivers. Adequate readiness can significantly contribute to the promotion of recovery and achieving better outcomes (Luther et al., 2019). Nurses play a vital role in discharge planning and assessing hospital readiness to ensure the continuity of patient nursing care, both during the hospital stay and at home (Bahr et al., 2020). Patients and family caregivers are emotionally and physically prepared for discharge by carefully analyzing their needs in this discharge planning process. Incorporating discharge readiness assessment into prelicensure programs and ongoing education for nurses is essential (Vernon et al., 2019).

However, the level of discharge preparedness can vary based on the nurse's experience and background. A previous study identified factors associated with caregivers' discharge readiness, such as the patient's physical activity and discharge preparation, the presence of someone to help, and the difficulty of care (Huang et al., 2022). Similar findings were observed in another study, highlighting factors such as patient functional status, disease and symptom status, connections to community resources/support, home safety needs, and environmental and care coordination influencing caregiver discharge readiness (OConnor et al., 2021).

The Standard Operating Procedures for discharge planning at the study hospital outline specific procedures nurses must follow during discharge planning. These include conveying greetings, explaining the purpose of the upcoming actions to the patient, inquiring about the patient's identity (including name and date of birth), assessing the patient's knowledge about their illness, identifying involved family members, and examining discharge planning criteria (e.g., patient's age, mobility difficulties, need for medical and nursing services, assisted daily living requirements, self-care ability, use of health facilities, and medication needs). The nurses then formulate discharge plans based on the assessment results, implement the discharge planning (particularly through education), evaluate the implementation, and document the outcomes on the patient's return home resume form (Hasan Sadikin Hospital, 2018). However, this standard operating procedure lacks an assessment of the readiness of patients or their caregivers for hospital discharge.

Given the long-term commitment required from caregivers in TBI cases, especially within the context of limited resources in Indonesia, this study aimed to assess the readiness for hospital discharge among caregivers of patients with moderate or severe TBI and explore associated factors.

Methods

Study Design
The cross-sectional study took place at a sole facility within a tertiary hospital in West Java, specifically in Bandung, Indonesia, spanning from January to April 2023.

Samples/Participants
This study employed a purposive sampling technique with predefined inclusion and exclusion criteria. The sample size was determined using the findings of a prior study (Weiss et al., 2011) and a power analysis. With an effect size of 0.32, a significance level (α) of 0.05, an expected power of 0.80, and an effect size estimate of 0.30, a total of seventy-four caregivers of TBI patients who met the inclusion criteria were recruited. Eligible participants were required to 1) be 18 years or older, 2) be a family member who identified as the primary caregiver or was responsible for the care of the TBI patient at home, and 3) have the capability to engage in communication, comprehend written text, compose written content, and articulate thoughts in the Indonesian language. The severity of traumatic brain injury was classified by the neurosurgeon based on the Glasgow Coma Scale results.

Instruments
Data collection involved a questionnaire covering caregiver information (gender, age, education level, income, and psychological status) and discharge readiness. Self-assessment tools specifically created for caregivers used The Preparedness for Caregiving Scale (Archbold et al., 1990). It consists of eight items that evaluate caregivers' self-perceived readiness in diverse caregiving areas. In this context, "preparedness" pertains to caregivers' confidence in handling different aspects of caregiving responsibilities, such as offering support, providing care, organizing services, and coping. The five-point scale consists of eight questions with scores of zero (not at all prepared) to four (very well prepared). The meaning of all answered items is computed to calculate the scale score, resulting in a score range of 0 to 32. A higher score indicates a greater sense of preparedness, while a lower score suggests less. Caregivers are deemed ready if their score exceeds 12 (Archbold et al., 1990).

The translation of the instrument into Indonesian employed the back-translation method (Tyupa, 2011). A team of qualified native English-speaking translators translated the source documents into Indonesian. After the primary translation, a different translator, who had not been exposed to the original text before, rendered the document back into English. The researchers then systematically compared the back-translated content with the original text, and an additional bilingual linguist, not involved in the prior translation steps, provided further verification. Thirty caregivers of TBI patients participated in evaluating item validity. The examination of item validity assessments, carried out using SPSS version 26.0, revealed corrected correlations across items ranging above 0.77. Additionally, the Cronbach's alpha value computed was above 0.89.

Data Analysis
The normality test indicated that the variable measuring readiness for hospital discharge follows a normal distribution. Numerical data were displayed in terms of mean, while categorical were represented as percentages or proportions. Pearson correlation analysis was utilized to examine the correlation between age, duration of patient care, and total monthly income with readiness for hospital discharge. Associations between gender, relationship with the patient, education, and readiness for discharge were assessed through chi-square tests. The predetermined level of statistical significance was set at $p < 0.05$.

Ethical Consideration
Permission for conducting this research was granted by The Center for Social and Behavioral Science IRB (2022-St-Nur-St-35) and The Hospital Research Ethics Committee (LB.02.01/X.6.5/459/2022). Before consenting, participants were informed about the study's goals, potential benefits, associated risks, and the option to withdraw. Confidentiality and anonymity were assured regarding their participation and the reporting of findings.

Results

Demographic Characteristics of Caregivers
This study involved the participation of 74 caregivers providing support to individuals with moderate or severe TBI. Most caregivers were women (83.8%), married (50%), and possessed a high school diploma (52.7%). The average age of the caregivers was 43.7 years (SD = 8.7). The mean duration of patient treatment during hospitalization, prior to discharge, was 4.22 days (SD = 1.2). The average monthly gross income reported was Rp 3.000.300 (equivalent to $220) (**Table 1**).

Table 1 Demographics of study participants ($N = 74$)

Variables	n (%)	Mean ± SD (Min-Max)
Gender		
Male	12 (16.2%)	
Female	62 (83.8%)	
Relationship with patient		
Spouse	37 (50%)	
Parent-child	31 (41.9%)	
Sibling	6 (8.1%)	
Education		
Low (primary school)	30 (40.5%)	
Moderate (high school)	39 (52.7%)	
High (vocational/university)	5 (6.8%)	
Age (years)		43.7 ± 8.7 (23-60)
Duration of patient care (days)		4.22 ± 1.2 (2-7)
Total income per month (million rupiahs)		220 ± 12 (130-400)

Description of the Readiness of Hospital Discharge
Results from the descriptive analysis showed that caregivers' readiness for hospital discharge was 10.8 (**Table 2**), which indicated that they were unready for discharge based on the readiness criteria.

Table 2 Demographics of study participants ($N = 74$)

Variable (questions)	Mean	SD	Min-Max
Total score readiness of hospital discharge	10.08	1.91	8-15
How well prepared do you think you are to take care of your family member's physical needs?	2.4	0.8	0-3
How well prepared do you think you are to take care of his or her emotional needs?	2.5	0.9	1-3
How well prepared do you think you are to find out about and set up services for him or her?	2.8	0.9	1-4
How well prepared do you think you are for facing the stress of caregiving?	2.1	0.8	0-3
How well prepared do you think you are to make caregiving activities pleasant for both you and your family members?	2.8	0.9	0-3
How well prepared do you think you are to respond to and handle emergencies that involve him or her?	2.5	0.8	0-3
How well prepared do you think you are to get the help and information you need from the health care provider?	2.7	0.7	1-3
Overall, how well prepared do you think you are to care for your family member?	2.5	0.6	1-4

Relationship between Characteristics of Caregivers and Readiness of Hospital Discharge

Bivariate analysis showed that age and education were significantly associated with readiness for discharge ($p < 0.05$), while other factors were not, as shown in **Table 3**.

Table 3 Correlations between characteristics of caregivers and readiness for hospital discharge ($N = 74$)

Variables	Statistics	p
Age[a]	0.35	0.03*
Duration of patient care[a]	0.05	0.37
Income[a]	0.12	0.09
Gender[b]	0.32	0.08
Relationship with patient[b]	0.45	0.36
Education[b]	0.44	0.02*

Note: a = Pearson correlation test; b = Chi-square test; * p-value < 0.05

Discussion

In this study, most of these caregivers were women, predominantly spouses or parents of the patients, and fell within the middle-aged group, aligning with patterns observed in other caregiver groups for chronic diseases. The study further corroborates existing literature, emphasizing a higher proportion of female caregivers than male caregivers (Casado Mejía & Ruiz-Arias, 2016). Their readiness before discharge was evaluated, highlighting the importance of nurses assessing patients and caregivers to adequately prepare them and their environment selecting appropriate interventions to enhance their understanding and skills (Galvin et al., 2017). Caregivers in this study received education from nurses during interactions in the inpatient room as part of the hospital's discharge planning program. This program entails assessing the needs of patients and families, providing interventions based on the assessment results, and subsequent evaluation. Nevertheless, caregivers of patients with moderate or severe TBI demonstrated a low readiness score for hospital discharge, with a mean of 10.08. TBI survivors reported feeling less prepared to seek assistance and information from the healthcare system and manage caregiving stresses (Lieshout et al., 2020).

In this research, patients demonstrated a substantial reliance on care upon discharge, particularly those with craniotomy wounds who experienced pain. The majority also required a nasogastric tube, while some individuals using urinary catheters and tracheostomies faced challenges in mobility and encountered visual disturbances. The care requirements for all TBI patients in this study remained considerable. Despite this, nurses sought more targeted education or practical demonstrations on managing these issues when caring for patients. Conversely, caregivers were anticipated to possess comprehensive skills and knowledge in caring for patients.

Nonetheless, the acknowledged low level of readiness was partly attributed to inadequate teaching skills demonstrated to caregivers. A previous study recommended the provision of education and demonstrations for caregivers, emphasizing its importance in providing better support to patients before and after hospital discharge, improving self-independence, and reducing the caregiving burden (Smith et al., 2019). Demonstrations allow caregivers to practice expected skills,

ensuring their readiness, while nurses can promptly evaluate caregivers' skills before the patient returns home.

Bivariate analysis revealed that education and age were associated with readiness for discharge, consistent with previous literature (Bobay et al., 2010). It highlights the importance of considering age-related differences in discharge education and readiness, emphasizing the necessity for pre-discharge assessment. Moreover, most caregivers in this study had an intermediate level of education, which aligns with the educational distribution in Indonesia, where only 8.5% hold a university degree (Central Bureau of Statistics Indonesia, 2020). Higher education in Indonesia typically refers to post-secondary education, including diplomas, bachelor's degrees, master's degrees, professional graduate programs, and doctoral degree programs offered by higher education institutions. Individuals with higher education levels in Indonesia tend to find it easier to access hospital training than those with lower education levels (Siow et al., 2019).

Concerning discharge preparation, information proves valuable in enhancing knowledge and engagement. It is recommended to utilize active educational strategies, such as involving participants in the discharge plan and running multiple educational sessions to reinforce and clarify concepts (Ostwald et al., 2014). Skill-building has been shown to improve TBI outcomes post-hospital discharge (Kreutzer et al., 2015). Additionally, a previous review focusing on intermediate care for TBI patients and caregivers in low- and middle-income countries (LMICs) emphasized the essential role of dedicated programs for caregivers to optimize continuity of care and discharge outcomes (Ganefianty et al., 2023).

Limitations

This study has certain limitations that should be acknowledged. Firstly, the sample was restricted to a single tertiary hospital with a relatively small size. Consequently, the findings may not be universally applicable to the entire TBI population. Other potential factors, such as patient and environmental variables, could be linked to nursing staff preparation, but these were not explored in this study.

Implications for Nursing Practice

Based on the findings, this study has several implications for nursing practice: First, nurses must prioritize the assessment of caregiver readiness, particularly among predominantly female caregivers who are often spouses or parents of patients with TBI, before discharge. This assessment should consider factors such as age and education level, which have been shown to significantly influence caregivers' readiness. Second, tailored education and practical demonstrations are imperative for caregivers to effectively manage specific challenges such as craniotomy wounds, pain management, and the use of medical devices like nasogastric tubes, urinary catheters, and tracheostomies. Third, active educational strategies, such as involving caregivers in the discharge plan and conducting multiple educational sessions, are essential for enhancing knowledge retention and engagement. Fourth, there is a need to advocate for dedicated caregiver support programs, especially in LMICs, to optimize continuity of care and discharge outcomes. These programs should focus on skill-building and providing ongoing support to caregivers to

ensure they are well-prepared to care for TBI patients post-discharge.

Conclusion

In conclusion, nurses play a crucial role in preparing both patients and caregivers for the transition from hospital to home care, especially in traumatic brain injury cases. By assessing caregiver readiness, tailoring education, and advocating for dedicated support programs, nurses can enhance outcomes and quality of life for patients and caregivers. It emphasizes the importance of a comprehensive approach to discharge planning and caregiver support in nursing practice, ultimately contributing to improved outcomes for patients with TBI. Moreover, considering factors such as age and education level in discharge education is crucial for ensuring the readiness of caregivers from diverse backgrounds. Additionally, advocating for dedicated caregiver support programs, especially in regions with limited resources, is essential for optimizing continuity of care and discharge outcomes. Moreover, forthcoming research should investigate educational or supportive interventions in this context. Overall, the findings emphasize the importance of a comprehensive approach to discharge planning and caregiver support in nursing practice, contributing to improved outcomes and quality of life for patients with TBI and their caregivers. As healthcare continues to evolve, nurses must remain proactive in addressing the unique needs of patients and caregivers, fostering partnerships that extend beyond the hospital setting to support ongoing care in the community.

Declaration of Conflicting Interest

The authors declared no conflict of interest.

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Authors' Contributions

All authors contributed to the final manuscript and were accountable for each step of the study. AG designed the study, wrote and revised the manuscript, and analyzed the data. PS analyzed the data and wrote and revised the manuscript. JD designed the study and wrote and revised the manuscript.

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Data Availability

The datasets generated during and analyzed during the current study are available from the corresponding author upon reasonable request.

Declaration of Use of AI in Scientific Writing

The authors have declared that no generative AI was used in writing.

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