

READINESS FOR HOSPITAL DISCHARGE AND INFLUENCING FACTORS OF FAMILY CAREGIVERS OF PATIENTS WITH COGNITIVE IMPAIRMENT AFTER TRAUMATIC BRAIN INJURY: A CROSS-SECTIONAL SURVEY FROM WENZHOU, PR CHINA

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Abstract. Traumatic brain injury (TBI) creates substantial challenges for patients and their family caregivers, especially during hospital-to-home transition. Given the family caregivers' primary role in post-discharge care in PR China, this cross-sectional study enrolled TBI patients and their respective family caregivers ($n = 146$ for each group) at a tertiary hospital in Wenzhou, Zhejiang to assess the caregivers' readiness for patients' discharge and identify predictors of preparedness via several validated questionnaires, namely Readiness for Hospital Discharge Scale (FAM-RHDS), General Self-Efficacy Scale (GSES), Family Needs Questionnaire - Revised (FNQ-R), and Quality of Life after Brain Injury (QOLIBRI). The results showed that 64% of caregivers had high readiness. Multiple regression analysis identified caregiver education level, self-efficacy and family needs, and patient's age and quality of life as significant predictors, covering 74.6% of variance in discharge readiness. In conclusion, this study showed that a family caregiver readiness for the TBI patient's hospital discharge was affected by both caregiver- and patient-related factors, highlighting the need for targeted interventions, such as personalized education programs and support services, to enhance caregivers' readiness and optimize post-discharge outcomes for TBI patients.

Keywords: family caregiver, hospital discharge, self-efficacy, traumatic brain injury, quality of life

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INTRODUCTION

Traumatic brain injury (TBI) is a significant global public health challenge, leading to a high rate of mortality and long-term disability (Schneider *et al*, 2021). TBI has increasingly shifted from an acute event to a chronic condition, which requires long-term care, thereby imposing substantial economic burden on families due to ongoing medical expenses, lost income and need for continuous caregiving.

In China, the incidence of TBI has shown a continuous upward trend, with road injury being the leading cause. Regions such as the Yangtze River Delta, including Wenzhou, Zhejiang Province, report particularly high rates of TBI (Yang *et al*, 2022).

Among TBI sequelae, cognitive impairment presents unique challenges, often requiring 24-hour

supervision and management of behavioral changes. Compared with general TBI patients, those with cognitive impairment face unique challenges such as impaired judgment, memory loss and impulsive behavior, which increase caregivers' responsibility in ensuring patients' safety, managing daily routines and coping with unexpected behavioral changes. These particular difficulties make caregiver preparedness for discharge even more critical for this subgroup of TBI patients. In China, family caregivers - often spouse or female relative - play a primary role in post-discharge care, yet they frequently report feeling unprepared for this responsibility (Liu *et al*, 2015; Huang *et al*, 2022).

Caregiver readiness is crucial for successful hospital-to-home transitions, as it can reduce readmission rates and improve

patient outcomes (Huang *et al*, 2022). However, while Western studies have examined caregiver readiness for TBI patients (Denchev *et al*, 2023), there is limited data on how Chinese cultural norms (such as filial piety) and regional healthcare status influence discharge readiness for family caregivers of TBI patients with cognitive impairment, particularly in the Wenzhou region of the Yangtze River delta, where there is a high TBI frequency (Yang *et al*, 2022).

Our cross-sectional study, therefore, assessed the readiness for hospital discharge among family caregivers of TBI patients in Wenzhou and identified key predictors of their preparedness. Our findings should help to inform future improvements in supportive interventions and transitional care practices in similar healthcare settings.

MATERIALS AND METHODS

Study design and participants' selection

Our cross-sectional study took

place at The First Affiliated Hospital of Wenzhou Medical University, the largest tertiary hospital in southeastern Zhejiang Province, from November to December 2024. The participants' sample size was determined using the previously described method (Sanders *et al*, 2023), which reported a 32.7% proportion of the psychosocial outcome domain related to TBI caregiver preparedness, along with a power analysis. With an effect size of 0.15 (Cohen's f^2), an α error probability of 0.05 and a desired power of 95%, the analysis indicates a minimum of 146 participants for both TBI patients and their respective family caregivers. Inclusion criteria of family caregivers were i) ≥ 18 years of age, ii) cohabiting with the TBI patient, iii) able to communicate in Mandarin and independently complete the questionnaire, and iv) voluntary participation. Inclusion criteria of TBI patients were i) 18-60 years of age, ii) stable vital signs and "pre-discharge" medical order, iii) Glasgow coma scale (GCS) score = 15

at discharge, iv) confirmed cognitive impairment [determined by the Montreal cognitive assessment (MoCA) score <26 (mild to moderate cognitive deficit) or the minimal state examination (MMSE) score <24 (cognitive impairment)] administered by trained researchers within 72 hours before discharge, and v) no severe comorbidities (*eg*, end-stage renal disease or malignant tumor).

Data collection

Data were collected using a structured questionnaire comprising two parts: 1) sociodemographic information of family caregivers and TBI patients (*eg*, age, education, income, and health status) and TBI patients' medical history (*eg*, diagnosis, GCS score and length of stay), and 2) five validated scales (described below).

Readiness for Hospital Discharge Scale-Family Caregiver of Adult Patient Form (FAM-RHDS):

This 29-item questionnaire assesses family caregiver readiness across four domains, namely personal

status (14 items), knowledge (9 items), perceived coping ability (3 items), and expected support (3 items). Each item is rated on a scale from 0 to 10, with a total score ranging from 0 to 290. The original English version (Mackenzie *et al*, 2007) was translated into Mandarin using Brislin's back-translation method (Xiong *et al*, 2021). Pilot test with 30 caregivers demonstrated excellent internal consistency (Cronbach's $\alpha = 0.98$).

Quality of Life After Brain Injury (QOLIBRI):

This 37-item questionnaire evaluates health-related quality of life in TBI patients across six domains, namely cognition, self-awareness, daily life autonomy, social relationships, and emotional and physical problems. Responses are converted to a 0-100 scale, with higher scores reflecting better quality of life. The original English version (Hunt *et al*, 2019) was translated into Mandarin using Brislin's back-translation method (Hu *et al*, 2012). Pilot test with 30 caregivers demonstrated good internal consistency (intra-class

correlation coefficient (ICC) = 0.74-0.94, Cronbach's α = 0.86).

General Self-Efficacy Scale (GSES): This 10-item questionnaire measures family caregivers' confidence in caregiving tasks. Items are scored from 1 (not at all true) to 4 (exactly true), with a total score ranging from 10 to 40. The original English version (Caruso *et al*, 2016) was translated into Mandarin using Brislin's back-translation method (Li *et al*, 2023). Pilot test with 30 caregivers demonstrated strong internal consistency (Cronbach's α = 0.89).

Family Needs Questionnaire-Revised (FNQ-R): This 37-item questionnaire evaluates unmet family needs, such as health information, emotional and professional support, and community resources. Items are scored from 1 (met) to 3 (unmet), with a total score ranging from 37 to 111. The original English version (Norup *et al*, 2015) was translated into Mandarin using Brislin's back-translation method (Cui *et al*, 2014). Pilot test with 30 caregivers

demonstrated good reliability (Cronbach's α = 0.69-0.85).

Data analysis

Descriptive statistics (mean, standard deviation (SD), frequency, and percentage) are used to summarize the sample characteristics and key variables. Pearson's correlation analysis was employed to examine bivariate relationships between family caregiver readiness for BTI patients' hospital discharge and continuous predictor variables. An independent sample t-test was used to compare FAM-RHDS scores between categorical sociodemographic groups (*eg*, gender and health status of caregivers). Multiple linear regression was performed to identify significant predictors of family caregiver readiness for BTI patients' hospital discharge. Multicollinearity among predictor variables was determined using the variance inflation factor (VIF) values. A VIF threshold of <5 is considered indicative of non-significant multicollinearity.

Statistical significance is accepted at p -value <0.050 . Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.0 (IBM Corp, Armonk, NY).

Ethical consideration

The study protocol was approved by the Research Ethics Review Board, Faculty of Nursing, Burapha University (approval no. G-HS080/2567) and the First Affiliated Hospital of Wenzhou Medical University (approval no. KY2024-178). Prior written consent was obtained from each participant.

RESULTS

Sociodemographic characteristics of family caregivers and TBI patients

Family caregivers and their respective TBI patients ($n = 146$ each group) participated in our study. Family caregivers were 43 ± 12 (mean \pm SD) years of age, the majority being females (70%) and spouses (53%); 33% having completed high school, while only 1% a bachelor's degree or higher; and 40% earning an annual

income $>$ CNY 200,000 (USD 29,000) (Table 1).

TBI patients were of similar age (41 ± 11 years old), but 72% were males. In terms of occupation, 31% were self-employed, followed by enterprise staff (19%), unemployed (16%), government employee (10%), freelancer (10%) and other occupations (14%); 30% had completed high school and 32% middle school, with only 4% holding a bachelor's degree or higher, 12% college education, 10% elementary school education and 12% no formal education. The most common clinical presentation at admission was intracranial injury (82%), followed by scalp injury (12%), skull fracture (4%) and concussion (2%); the mean GCS score at admission was 8.8 ± 2.7 , with 26% of patients scoring ≤ 8 , 23% 9-11, 27% 12-14 and 24% 15. The average length of hospital stay was 17 ± 7 days, with 29% of patients staying 15-21 days, 27% 8-14 days, 25% 1-7 days, 10% 22-28 days and 9% more than 28 days (Table 2).

Table 1

Sociodemographic characteristics of family caregivers of TBI patients
(N = 146), Wenzhou, Zhejiang, PR China

Characteristic	Frequency* <i>n</i> (%)
Gender	
Male	44 (30)
Female	102 (70)
Age in years, mean \pm SD	43 \pm 11
Age group	
18-29 years	24 (16)
30-44 years	59 (40)
45-59 years	49 (34)
\geq 60 years	14 (10)
Occupation	
Unemployed	33 (24)
Government employee	24 (16)
Enterprise staff	21 (14)
Self-employed	22 (15)
Freelancer	21 (14)
Other	25 (17)

Table 1 (cont)

Characteristic	Frequency* n (%)
Education level	
None	12 (8)
Elementary school	31 (22)
Middle school	42 (29)
High school	48 (33)
College	11 (7)
Bachelor's degree or above	2 (1)
Annual income	
<CNY 100,000	43 (30)
CNY 100,000-200,000	44 (30)
>CNY 200,000	59 (40)
Relationship with TBI patient	
Spouse	77 (53)
Parent	38 (26)
Daughter/son	23 (15)
Sibling	6 (5)
Other relative	2 (1)
Health status	
Healthy	91 (62)
With condition	55 (38)

*Unless otherwise stated

CNY: Chinese Yuan, CNY 1 = USD 0.145 (exchange rate as of January 2026);

SD: standard deviation; TBI: traumatic brain injury

Table 2

Sociodemographic characteristics and clinical pictures at admission of TBI patients (N = 146), The First Affiliated Hospital of Wenzhou Medical University, Wenzhou, Zhejiang, PR China

Characteristic	Frequency* <i>n</i> (%)
Gender	
Male	105 (72)
Female	41 (28)
Age in years, mean \pm SD	41 \pm 11
Age group	
18-29 years	26 (18)
30-44 years	67 (46)
45-60 years	53 (36)
Occupation	
Unemployed	23 (16)
Government employee	15 (10)
Enterprise staff	27 (19)
Self-employed	45 (31)
Freelancer	15 (10)
Other	21 (14)
Education level	
None	18 (12)
Elementary school	15 (10)
Middle school	46 (32)
High school	44 (30)
College	18 (12)
Bachelor's degree or above	5 (4)

Table 2 (cont)

Characteristic	Frequency* n (%)
Annual income	
<CNY 100,000	46 (31)
CNY 100,000-200,000	54 (38)
>CNY 200,000	46 (31)
Clinical presentation at admission	
Scalp injury	18 (12)
Skull fracture	5 (4)
Intracranial injury	120 (82)
Concussion	3 (2)
GCS score at admission, mean \pm SD	8.8 \pm 2.7
≤ 8	36 (26)
9-11	33 (23)
12-14	43 (27)
15	34 (24)
Length of stay, mean \pm SD	17 \pm 7
1-7 days	37 (25)
8-14 days	40 (27)
15-21 days	42 (29)
22-28 days	15 (10)
>28 days	12 (9)

*Unless otherwise stated

CNY: Chinese Yuan, CNY 1 = USD 0.145 (exchange rate as of January 2026); GCS: Glasgow coma scale; SD: standard deviation; TBI: traumatic brain injury

TBI patients' medical history

The most common presentation (82%) of the patients at hospital admission was intracranial injury, with a mean Glasgow coma scale (GCS) score of 8.8 ± 2.7 , indicating moderate to severe cognitive impairment. The average length of hospital stay was 17 ± 7 days. At discharge, all patients had a GCS score of 15, which met our study inclusion criteria of a stable condition and discharge documentation.

Family caregiver readiness for TBI patient's hospital discharge

The mean \pm SD score on the FAM-RHDS was 193 ± 42 , ranging from 110 to 273. Based on the classification of Rababah *et al* (2025), readiness is categorized as low (score of 0-174), moderate (score of 175-230), and high (score of 231-290). Thus, the family caregiver readiness was considered moderate. Subscale analysis (based on standardized item mean, ie, total score divided by number of items) revealed that family caregivers

scored highest in the expected support domain (7.7 ± 2.1), followed by perceived coping ability (6.9 ± 1.5) and knowledge (5.9 ± 1.4), with the lowest score in the personal status domain (3.3 ± 0.8) (Table 3).

The mean \pm SD score for general self-efficacy among the family caregivers was 27.6 ± 11.9 , with 47% reporting a "good" level of self-efficacy (Table 4). Regarding family needs, the mean \pm SD score was 59.4 ± 10.0 , with 98% reporting "partly met" needs. The mean \pm SD QOLIBRI score was 59.4 ± 14.2 , the possible score range being 0-100, with a higher score indicating a better health-related quality of life.

Predictors of family caregiver readiness for TBI patients' hospital discharge

Multicollinearity analysis revealed that variance inflation factor (VIF) values for all predictor variables were <3 (educational level = 1.56, patient age = 1.28, self-efficacy = 1.82, family needs = 1.69; TBI patient's QOLIBRI score = 1.73), indicating no marked

Table 3

Readiness scores of family caregivers for TBI patients' hospital discharge ($n = 146$)

Readiness for hospital discharge subscales	Mean \pm SD*
Personal status	
TBI patients	
Total score range, min-max ^a	21.0-66.0
Total score	45.6 \pm 11.1
1a. How physically ready is your TBI family member to go home?	6.9 \pm 1.9
2a. How would you describe your TBI family member's level of pain or discomfort today?	6.4 \pm 1.9
3a. How would you describe your TBI family member's strength today?	6.3 \pm 1.9
4a. How would you describe your TBI family member's energy today?	6.4 \pm 2.0
5a. How much stress is your TBI family member feeling today?	6.6 \pm 1.8
6a. How emotionally ready is your TBI family member to go home today?	6.5 \pm 1.9
7a. How would you describe your family member's physical ability to care for him/herself today (eg, hygiene, walking, toileting)?	6.5 \pm 1.8
Family caregivers	
Total score range, min-max ^b	24.0-67.0
Total score	45.7 \pm 10.9
1b. How physically ready are you to take your TBI family member home today?	6.9 \pm 2.0
2b. How would you describe your level of pain or discomfort today?	6.6 \pm 1.8
3b. How would you describe your strength today?	6.3 \pm 1.9
4b. How would you describe your energy today?	6.4 \pm 1.9
5b. How much stress do you feel today?	6.5 \pm 1.9
6b. How emotionally ready are you to take your TBI family member home today?	6.6 \pm 1.8
7b. How would you describe is your physical ability to care for your TBI family member today (eg, helping with his/her hygiene, walking, toileting)?	6.5 \pm 1.9

Table 3 (cont)

Readiness for hospital discharge subscales	Mean \pm SD*
Knowledge	
Total score range, min-max ^c	23.0-76.0
Total score	53.3 \pm 12.6
8. How much do you know about caring for your TBI family member after he/she goes home?	6.5 \pm 1.9
9. How much do you know about taking care of your TBI family member's personal needs (eg, hygiene, bathing, toileting, feeding, exercising) after he/she goes home?	6.6 \pm 1.9
10. How much do you know about taking care of your TBI family member's medical needs (treatment, medication) after he/she goes home?	6.7 \pm 1.9
11. How much do you know about problems of your TBI family member to watch out for after going home?	6.7 \pm 2.0
12. How much do you know about who and when to call if your TBI family member has problems after going home?	6.7 \pm 2.0
13. How much do you know about restrictions (what your TBI family member is allowed and not allowed to do) after going home?	6.7 \pm 1.9
14. How much do you know about your TBI family member's follow-up medical treatment plan after going home?	6.7 \pm 1.9
15. How much do you know about services and information available to you and your family member in your community after going home?	6.7 \pm 2.0
Perceived coping ability	
Total score range, min-max	9.0-29.0
Total score	20.7 \pm 4.6
16. How well will you be able to handle the demands of life at home?	6.9 \pm 1.7
17. How well will you be able to perform your TBI family member's personal care (eg, eating, hygiene, bathing, toileting,) at home?	7.0 \pm 1.6
18. How well will you be able to perform your TBI family member's medical treatments (eg, caring for a wound, breathing treatment, using equipment, giving medication in the correct amount and at the correct time) at home?	6.8 \pm 1.6

Table 3 (cont)

Readiness for hospital discharge subscales	Mean \pm SD*
Expected support	
Total score range, min-max	13.0-39.0
Total score	20.7 \pm 4.6
19. How much emotional support will you have after your TBI family member goes home?	6.8 \pm 1.7
20. How much help will you have, if needed, with your TBI family member's personal care after he/she goes home?	6.8 \pm 1.7
21. How much help will you have, if needed, with your TBI family member's household activities (eg, cooking, cleaning, shopping, babysitting) after he/she goes home?	6.8 \pm 1.7
22. How much help will you have, if needed, with your TBI family member's medical care needs (treatment, medication) after he/she goes home?	6.8 \pm 1.6

*Unless otherwise stated

^aScoring system: from 1a to 7a; ^bScoring system: from 1b to 7b; ^cScoring system: from 8 to 15; ^dScoring system: from 16 to 18; ^eScoring system: from 19 to 22

min-max: minimum value - maximum value; SD: standard deviation; TBI: traumatic brain injury

Table 4
Self-efficacy, family needs and QOLIBRI scores

Tool	Mean \pm SD	Category, score range (<i>n</i>)
Self-efficacy (GSES)	27.6 \pm 11.9	Good, 26.0-34.0 (47)
Family needs (FNQ-R)	59.4 \pm 10.0	Partly met, score range 38.0-73.0 (98)
QOLIBRI	59.4 \pm 14.2	Score range 0.0-100.0 (146)*

*Higher score indicates better health-related quality of life.

FNQ-R: family needs questionnaire-revised; GSES: general self-efficacy scale; QOLIBRI: questionnaire on quality of life after brain injury; SD: standard deviation

multicollinearity. Additionally, a comparison of scale items confirmed that GSES (measuring family caregiver confidence) and FAM-RHDS (measuring family caregiver readiness for TBI patients' hospital discharge) assessed distinct constructs with no overlapping contents. Multiple

linear regression analysis identified five significant predictors (age, educational level, family needs, health-related quality of life, and self-efficacy) of family caregiver readiness for TBI patients' hospital discharge, which together covered 74.6% of the variance (adjusted $R^2 = 0.746$) (Table 5).

Table 5
Multiple linear regression analysis of predictors of family caregiver readiness for BTI patient's hospital discharge

Variable	b	SE	β	t	p-value*
Educational level	12.186	2.512	0.323	4.852	<0.001
Age	-0.516	0.168	-0.135	-3.066	0.003
Self-efficacy	1.335	0.377	0.200	3.547	0.001
Family needs	-0.732	0.201	-0.210	-3.638	<0.001
Health-related quality of life	0.520	0.134	0.253	3.872	<0.001

$R = 0.86$; $R^2 = 0.75$; Adjusted $R^2 = 0.746$; Sest = 5.12

The regression model is $126.721 + (12.186 \times \text{Educational level}) - (0.516 \times \text{Age}) + (1.335 \times \text{Self-efficacy}) - (0.732 \times \text{Family needs}) + (0.520 \times \text{Health-related quality of life})$

* p -value<0.050 is considered statistically significant

b: unstandardized regression coefficient; R: multiple correlation coefficient; R^2 : coefficient of determination; SE: standard error; Sest: standard error of the estimate; t: Student's t -statistic; VIF: variance inflation factor; β : standardized regression coefficient

DISCUSSION

Our study investigated the readiness for hospital discharge among family caregivers of patients with traumatic brain injury in Wenzhou, China, and identified the predictive factors.

Our findings revealed that 64% of caregivers ($n = 94$) exhibited high readiness, while 36% reported low readiness, indicating notable variability in preparedness. Five significant predictors were identified, namely caregiver education level, family needs, and self-efficacy, patient's age and quality of life after brain injury. These factors accounted for 74.6% of the variance in readiness scores. The high adjusted R^2 value (0.746) might be attributed to the comprehensive selection of predictors, which covered both caregiver-related (education, family needs and self-efficacy) and patient-related (age and quality of life) factors, as well as the use of validated instrument scales that minimized overlapping scale items.

Notably, cognitive impairment - one of the core sequelae of TBI targeted in our study - exerted a unique impact on family caregiver readiness for TBI patients' hospital discharge. Unlike physical disabilities, cognitive impairments (eg, confusion, impulsive aggression and memory loss) create a "24-hour burden" that requires constant vigilance, as patients may be unable to recognize risks, adhere to treatment plans, or effectively communicate their needs. This specific type of challenge likely explained why self-efficacy emerged as a strong predictor: caregivers with higher confidence in managing unpredictable cognitive and behavioral symptoms were better prepared to handle the demands of post-discharge care, whereas those with low self-efficacy might feel overwhelmed by the required persistent supervision.

Our finding that education was the strongest predictor aligns with the global research linking higher education to better caregiving preparedness (Andriani

et al, 2022). In the context of the Chinese healthcare system, which often requires family caregivers to navigate complex administrative procedures (*eg*, insurance claims and follow-up appointment scheduling) and hands-on care tasks (*eg*, wound management and medication administration), without widespread access to professional home nursing services (Jin *et al*, 2023), a higher-level education likely equips caregivers with better health literacy and problem-solving skills. These capabilities enable them to understand medical information, troubleshoot care-related issues, and adapt to post-discharge challenges more effectively, thereby enhancing their readiness for discharge.

It is worth noting that only 1% of the family caregivers held a bachelor's degree or higher, which may not represent the general population of Wenzhou. This discrepancy could be attributed to the convenience sampling method used, as the cohort primarily included family caregivers who

were available to provide full-time care (*eg*, housewives, middle-aged and elderly relatives), a group that has a lower educational attainment compared to the general adult population in Wenzhou.

The significant role of self-efficacy is in agreement with the study of Henriksson and Årestedt (2013) and Bandura's theory (Ouyang *et al*, 2023), while unmet family needs as a negative factor was consistent with the study of Huang *et al* (2022) and the Caregiver Stress Process Model (Kuang *et al*, 2023). The positive correlation between patients' QOLIBRI score and caregiver readiness corroborates the findings by Truelle *et al* (2020). In addition, our study highlighted contextual nuances. For example, while education was a strong predictor, its effect might be moderated by systemic support. The patients' age also was a significant factor in our study cohort, which contrasts with other studies where it is non-significant, possibly reflecting cultural or healthcare system

differences (Leonard *et al*, 2024). This difference might also have been impacted by filial piety, a core value in Chinese culture that emphasizes children's responsibility to care for elderly family members and spouses' commitment to supporting each other (Liu, 2023). For younger patients, caregivers (often parents or spouses) might feel a stronger sense of moral obligation to provide care, motivating them to seek additional knowledge and assistance in building self-confidence. On the other hand, older patients might have more complex comorbidities alongside cognitive impairment, thereby increasing caregiver difficulty and reducing readiness. Additionally, filial piety may lead caregivers to prioritize the patient's needs over their own, potentially masking unmet personal needs but reinforcing the link between family support (a component of the expected support evaluated in the FAM-RHDS) and readiness for the patient's hospital discharge.

A key strength of our study is the use of a validated readiness

scale. However, our study had two inherent limitations: (i) we employed a single-site sampling and cross-sectional design; and (ii) we used criterion sampling based on participant's willingness to participate that might have introduced selection bias as we recruited participants who were available and willing to complete the questionnaire, and might have missed the most needy caregivers - those who were too burdened by caregiving tasks to participate. This omission could lead to an overestimation of family caregiver readiness, as the sample cohort might underrepresent caregivers with low preparedness and high need, limiting the generalizability of the findings to the broader population of family caregivers of TBI patients. Future research should employ longitudinal and multi-center designs to validate these predictors over time and across different settings.

In conclusion, our study highlighted that the family caregivers' education, self-efficacy,

family needs, and patient-related factors significantly influenced their readiness for hospital discharge of TBI patients. These findings highlight the need of a multifaceted, individualized plan for family caregiver preparedness of a TBI patient's care in transitioning from a medical facility to a home setting.

CONFLICT OF INTEREST DISCLOSURE

The authors declare no conflict of interest.

AVAILABILITY OF DATA

The datasets analyzed in the current study are available from the corresponding author upon reasonable request.

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