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Perception of transitional care quality associated with functional outcomes among patients with fractures and stroke in Taiwan

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ABSTRACT

This study aimed to examine the relationship between self-perceived quality of transitional care and functional outcome among patients with stroke and fractures. The Care Transition Measure (CTM-15) was used to survey patient's self-perceived transitional care quality before discharge. General estimating equations were used to investigate the influences of transitional care quality on patient's functional outcomes at before, 1 week after, and 1 or 3 months after discharge. Among stroke patients, higher CTM-15 scores were positively associated with greater outcome in Instrumental Activities of Daily Living (IADL) following discharge. Higher scores for "reader-friendly written care plan," "consideration of patient's preferences," and "understanding of health management" had significantly positive effects on functional recovery in IADL among both patient groups following discharge. These findings suggest that heterogeneity in transitional care needs between medical and surgical patients shall not be overlooked. A one-size-fits-all strategy may be insufficient for ensuring patient care continuity following discharge.

Introduction

The quality of transitional care that a patient receives following a major injury or illness is crucial to their recovery. Numerous studies have reported the presence of strong negative feelings among patients and caregivers toward care transitions, including a feeling of unpreparedness, lack of self-care capability, lack of support, and disregard for preferences.[1] Problematic care transitions may lead to medication errors, unstable vital signs, deficiencies in care arrangement, and recidivism, particularly among patients with conditions that may require complex therapeutic regimens (e.g., stroke and hip fractures).[1–3,4] Studies have reported that comprehensive discharge planning with adequate post-discharge care support reduced the readmission risk of older patients with congestive heart failure by almost 25% and improved their quality of life.[5,6] Studies have found that poor-quality transitional care increases the risk of potentially avoidable hospital readmissions or recidivism to the emergency room among post-hospital patients.[1,7–10] Patients who receive transitional care with different levels of quality exhibit different levels of health status. Specifically, the quality of transitional care is positively correlated with quality of life, self-care capability, and self-rated health.[9,11] However, few studies have examined the influence of transitional care quality on the functional recovery of patients.

Assessing the quality of transitional care from the patient's perspective is crucial because patients are often cared for by multiple care providers,[12] and they must involuntarily endure the effects of care transfers even though they may not be equipped with the necessary skills and confidence for doing so.[2] Specifically, because the quality of transitional care is multidimensional, we must investigate not only the overall quality of transitional care but also whether the different domains of transitional care yield different influences on functional recovery. Furthermore, because surgical and medical patients have different care needs, the effect of transitional care quality on the outcomes of patients with different conditions warrants further investigations. Most studies have examined cardiovascular diseases.[5,7,13] However, whether the effects of transitional care

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quality on patient outcomes (e.g., functional recovery) differ between surgical and medical patients remains unclear.[10,11,14,15] Moreover, most studies have only measured and analyzed short-term outcomes at 1 month or earlier following discharge.[7,9,10,15] and only one study measured outcomes at multiple time points after hospitalization.[8] Fractures and stroke are the two most prevalent surgical and medical conditions, and post-discharge care plays a key role in the outcomes of patients with fractures and stroke. Due to different care needs post-discharge and recovery trajectories between stroke and fracture patients, we hypothesized that the associations between perceived quality of transitional care and functional status may be different for these two patient groups. More specifically, the influence of specific quality domains of transitional care on functional status may also be different between stroke and fracture patients. Therefore, we conducted separate analyses for these two patient groups. Furthermore, as the existing literatures mostly involve only general discussions of challenges in transitional care, less understanding of condition-specific transitional care needs among different patient groups is available. Our study aimed to investigate potentially different associations between perceived quality of transition care and post discharge functional status for stroke and fracture patients after controlling for other patient characteristics. Not only overall perceived quality was explored, but also specific quality domains of transitional care were also investigated.

Material and methods

Study setting, participants, and design

This study was a hospital-based prospective cohort study. We recruited eligible patients with fractures and stroke from a large medical center in Taiwan between December 26, 2018, and June 30, 2020. All hospitalized patients with fractures and stroke were assessed by clinicians before they were discharged. Only patients with moderate-severe stroke who had a modified Rankin scale score between 3 and 4 and patients with fractures who had a Barthel Index (BI) score between 40 and 70 were referred by case managers to the researchers and invited to participate because of their high recovery potential.[16,17] Each participant was interviewed face-to-face using a structured questionnaire before they were discharged from the hospital, and two follow-up telephone interviews were conducted following discharge. The first follow-up interview was conducted 1 week after discharge, and the second interview was conducted 1 month after discharge for patients with fractures and 3 months after discharge for patients with stroke. This study has been approved by the Institutional Review Board of Taipei Veterans General Hospital, Taiwan (reference number 2018−11−005AC#1).

Data collection procedure

A structured questionnaire was used to collect the required information at baseline and two follow-up interviews. The first follow-up interview was conducted 1 week after discharge, and the second interview was conducted 1 month after discharge for patients with fractures and 3 months after discharge for patients with stroke. During the baseline interview, we collected information on the participants' demographic characteristics (age and gender), educational level, living arrangement, type of primary caregiver, date of index admission, date of discharge preparation and assessment, prospective date of discharge, and participation or nonparticipation in the National Health Insurance Post-Acute Care (NHI-PAC) program following hospitalization. Taiwan's National Health Insurance program offers a universal and comprehensive health insurance coverage to all residents in Taiwan. It covers a wide array of outpatient services, inpatient services, emergency care, and prescription drugs in both public and private medical facilities with only a minimal cost sharing. There are four different levels of medical facilities in Taiwan: medical centers, regional hospitals, district hospitals, and clinics. In order to improve the prognosis outcomes of patients, reduce prolonged hospital stay at acute wards and alleviate family burdens of caring these patients at home, the NHI program launched a post-acute care project for stroke patients in 2014 and later expended to post-surgical fracture patients in 2017.[16,18,19] The NHI-PAC project provide patients with intensive multi-disciplinary inpatient rehabilitation care services in specialized PAC wards after patient is discharged from acute wards. We also asked participants about their medical decision-making preferences by using the Control Preference Scale.[20] Information on the participants' baseline cognitive function and functional status before discharge were collected using the Short Portable Mental Status Questionnaire (SPMSQ),[21] BI, and Instrumental Activities of Daily Living (IADL) scale.[22] During the two follow-up telephone interviews, information on their current care setting, the occurrence of readmission events, visits to the emergency department, and their functional status was collected. During the first follow-up telephone interview, the participants were asked about their perceived quality of the transitional care that they experienced during their transition from the hospital to their discharge setting using the Care Transition Measure-15 (CTM-15).[14]

Measures

BI and IADL were the two main outcome variables used to assess functional status. BI evaluates the basic ability such as walking and bathing whereas IADL represents a more complex daily activity such as basic consumption calculation and making a phone call. BI and IADL scores were obtained at baseline, 1 week after discharge, and 1 month (for patients with fractures) or 3 months (for patients with stroke) after discharge. Different lengths of follow-up times chosen for fracture and stroke patients because according to the literatures, these two groups of patients have different care needs and trajectories of potential recovery.[23–26] BI was scored from zero to 100, and IADL was scored from zero to 8. Both outcomes were constructed as continuous variables.

The main independent variable was patient's perceived quality of transitional care. Patient's perceived quality of transitional care was measured using the CTM-15. The CTM-15 is a widely adopted instrument for assessing the quality of transitional care in numerous countries.[8–10,14,15,27–35] The CTM-15 comprises 15 items, which assess four quality domains of transitional care, namely (1) critical understanding, (2), important preferences, (3) management preparation, and (4) care planning. These domains cover the discharge process, which includes the transfer of information; preparation of the subsequent care setting; communication among providers, patients, and caregivers; and the implementation of self-management with an adequate care plan. Chinese was the primary language for the participants. The validation study revealed that the Chinese-language CTM-15 has excellent test−retest reliability (correlation coefficient = 0.91) and a Cronbach's α value of 0.90.[9] To verify the applicability of the Chinese-language CTM-15 in the context of Taiwan, one family member of a patient, three patients, and a case manager were invited to review the wording of the Chinese-language CTM-15 and to provide their feedback on it. In addition, three experts from the fields of clinical medicine, nursing, and public health reviewed the instrument and the wording used in the questionnaire.

Each CTM-15 item was treated as a unidimensional measure rated on a 4-point Likert scale (strongly disagree = 1 point, disagree = 2 points, agree = 3 points, and strongly agree = 4 points). Items for which "I do not know/I do not remember/Not applicable" responses were not included in the raw score. A linear transformation of the raw score was performed to obtain a final score ranging between

zero and 100. The linear transformation formula is as follows: Score for each respondent = ([*summed score of answered questions*/*number of answeredquestions* − 1]/3) × 100. We subsequently constructed patient's perceived quality of transitional care as a dichotomous variable. The participants with a transformed CTM-15 score that was greater than the median score were considered to have experienced a high quality of transitional care, whereas those with a transformed CTM-15 score that was equal to or less than the median score were considered to have experienced a poor quality.

Statistical analysis

Basic descriptive statistics (frequency, mean, standard deviation, and proportion) were computed to describe the sample distributions of patient characteristics. Because of the repeated measurements of functional status that were taken and the longitudinal nature of our data, a generalized estimating equation was applied to analyze the relationship between quality of transitional care and the functional outcome of a patient. The following control variables were included in the models: Demographic characteristics (age and gender), educational level, cognitive function, medical decision-making style, type of primary caregiver, type of discharge setting, length of stay for index hospitalization, and length of follow-up. We entered the data by using Microsoft Excel 2016, and the accuracy of data entries was verified by an independent researcher. SAS 9.4 statistical software was used to perform our statistical analyses.

Results

354 patients participated in our study. Of the 187 patients with fractures, 178 (95.2%) completed the first follow-up, and 169 (90.4%) completed the second follow-up. Of the 197 patients with stroke, 187 (94.9%) completed the first follow-up, and 172(87.3%) completed the second follow-up. After the patients with missing data for independent and dependent variables were excluded, the final sample comprised 169 patients with fractures and 171 patients with stroke.

The mean CTM-15 score of the fracture group was 72.5, which was higher than that of the stroke group (67.1). The patients with stroke had a higher percentage of men, were relatively younger, and were more educated relative to the patients with fractures. The majority of the patients with fractures (61.2%) exhibited normal cognitive function at baseline. Their mean scores for BI and IADL at baseline were 50.5 (standard deviation [SD] = 11.1) and 1.7 (SD = 0.9), respectively. More than half of the patients with stroke (51.9%) exhibited normal cognitive function with a SPMSQ score ranging between 0 and 2 at baseline, and their mean scores for BI and IADL at baseline were 41.8 (SD = 27.2) and 1.5 (SD = 1.2), respectively. Both the fracture (92.7%) and stroke (92.6%) groups preferred to involve their physicians in their medical decision-making process. More than 80% of the patients in both the fracture (82.0%) and stroke (88.4%) groups participated in the NHI-PAC program (Table 1).

Table 2 lists the item-specific and factor-specific CTM-15 scores of the patients with fractures and stroke. For fracture patients, their mean scores for all four domains were all greater than 3. Fracture patients only scored less than 3 (2.94) for Item 7 ("When I left the hospital, I had a readable and easily understood written plan that described how all of my health care needs were going be met"). By contrast, stroke patients had a mean score of less than 3 for Factor 4. The lowest scores were observed for two items of Factor 4, namely Item 7 ("When I left the hospital, I had a readable and easily understood written plan that described how all of my health care needs were going be met") and Item 12 ("When I left the hospital, I had a readable and easily understood written list of the appointments or tests I needed to complete within the next several weeks").

Table 1
Patient characteristics.

	Fracture (*N* = 178)		Stroke (*N* = 187)	
CTM (Mean ± SD)	(72.51 ± 14.05)		(67.12 ± 14.08)	
Median	66.67		64.44	
≦ Median	96	53.93	124	65.61
> Median	82	46.07	65	34.39
Gender				
Male	68	38.2	101	53.44
Female	110	61.8	88	46.56
Age				
< 75	38	21.35	107	56.61
≧ 75	140	78.65	82	43.39
Education years				
≤ 6	92	51.69	53	28.04
> 6	86	48.31	136	71.96
SPMSQ				
Normal (0–2)	109	61.24	98	51.85
Cognitive impairement(3–10)	69	38.76	91	48.15
BI at Hospital (Mean ± SD)	(50.53 ± 11.05)		(41.82 ± 27.19)	
IADL at Hospital (Mean ± SD)	(1.70 ± 0.92)		(1.51 ± 1.17)	
Length of stay (Mean ± SD)	(6.60 ± 2.40)		(20.15 ± 6.90)	
Length of follow-up (Mean ± SD)	(9.98 ± 3.49)		(−1.12 ± 91.68)	
Control Preference Scale				
Self-decide	13	7.3	14	7.41
Physician participant	165	92.7	175	92.59
Primary caregiver				
Family member	81	45.51	85	44.97
Other caregiver	97	54.49	104	55.03
PAC participation				
Yes	146	82.02	167	88.36
No	32	17.98	22	11.64

Abbreviations: SD, standard deviation; CTM, care transition measure; SPMSQ, short portable mental status questionnaire; BI, Barthel index; IADL, instrumental activities of daily living; PAC, post-acute care.

Table 2
CTM-15 distrubution of item and factor by disease.

	Fracture			Stroke		
Care Transition Measure (CTM-15)	N	Mean	SD	N	Mean	SD
Factor 1: Critical understanding						
10. When I left the hospital I was confident that I knew what to do to manage my health	178	3.16	(0.56)	184	3.02	(0.58)
9. When I left the hospital, I had a good understanding of the things I was responsible for in managing my health.	177	3.20	(0.56)	184	3.07	(0.55)
11. When I left the hospital, I was confident I could actually do the things I needed to do to take care of my health	177	3.16	(0.60)	183	3.07	(0.58)
13. When I left the hospital, I clearly understood the purpose for taking each of my medications.	172	3.32	(0.53)	184	2.99	(0.60)
14. When I left the hospital, I clearly understood how to take each of my medications, including how much I should take and when.	173	3.31	(0.52)	181	3.02	(0.63)
15. When I left the hospital I clearly understood the possible side effects of each of my medications	169	3.11	(0.59)	180	2.78	(0.66)
Factor 1 Total	167	3.23	(0.45)	174	2.99	(0.47)
Factor 2: Preferences important						
2. The hospital staff took my preferences and those of my family or caregiver into account in deciding what my health care needs would be when I left the hospital	175	3.13	(0.57)	184	3.05	(0.59)
3. The hospital staff took my preferences and those of my family or caregiver into account in deciding where my health care needs would be met when I left the hospital.	175	3.17	(0.63)	185	3.11	(0.57)
1. Before I left the hospital the staff and I agreed about clear health goals for me and how these would be reached.	174	3.09	(0.63)	182	3.01	(0.66)
Factor 2 Total	171	3.13	(0.53)	179	3.06	(0.52)
Factor 3: Management preparation						
5. When I left the hospital, I clearly understood how to manage my health	177	3.19	(0.57)	185	3.10	(0.59)
6. When I left the hospital, I clearly understood the warning signs and symptoms I should watch for to monitor my health condition.	177	3.18	(0.58)	186	3.06	(0.58)
8. When I left the hospital I had a good understanding of my health condition and what makes it better or worse.	178	3.23	(0.58)	183	3.12	(0.56)
4. When I left the hospital, I had all the information I needed to be able to take care of myself.	177	3.14	(0.60)	185	3.11	(0.55)
Factor 3 Total	175	3.19	(0.50)	181	3.11	(0.47)
Factor 4: Care plan						
12. When I left the hospital, I had a readable and easily understood written list of the appointments or tests I needed to complete within the next several weeks.	168	3.32	(0.55)	143	2.71	(0.74)
7. When I left the hospital, I had a readable and easily understood written plan that described how all of my health care needs were going be met.	144	2.94	(0.68)	151	2.91	(0.71)
Factor 4 Total	141	3.13	(0.52)	118	2.80	(0.58)
Total Average Score (0–100)	178	72.51	(14.0)	187	67.12	(14.1)

Note: Item scores:Strongly Agree, 4; Agree, 3;Disagree, 2; Strongly Disagree, 1; Don't Know/Don't Remember/Not Applicable were not counted in the raw score, 0–100 CTM Score for each respondent = [(mean for each respondent-1)/3]*100.

Figs. 1 plots the functional status results (i.e., BI and IADL) of the patients with fractures and stroke at baseline, 1 week following discharge, and 1 month (for the patients with fractures) or 3 months (for the patients with stroke) following discharge. In the fracture group, no significant difference in BI scores was detected between the patients with high and low CTM-15 scores at baseline, 1 week following discharge, and 1 month following discharge. In the stroke group, the patients with a high CTM-15 score exhibited larger increases in both BI score (+ 32.8) and IADL score (+ 2.7) at 3 months following discharge relative to the patients with low CTM-15 scores.

After adjustments, no significant association was detected between overall CTM-15 score and BI score or between CTM-15 score and IADL score over the 1-month period (following discharge) in the fracture group (BI, b = 0.89, 95% confidence interval [CI] = −2.93, 4.70; IADL, b = 0.25, 95% CI = −0.05, −0.55; Table 3). Specifically, higher quality scores in considering the preferences of patients and the provision of a readable and easy-to-understand written care plan for the patients were significantly associated with improved IADL performance among the patients with fractures over the 1-month follow-up period (Table 3).

By contrast, although no significant association was detected between the overall CTM-15 score and BI score over the 3-month period among the stroke patients (b = 4.29, 95% CI = −3.63, 12.21), the overall CTM-15 score was significantly and positively associated with the IADL score (b = 0.51, 95% CI = 0.04, 0.99). Specifically, a higher quality score in providing a readable and easy-to-understand written care plan for the patients was also associated with improved IADL performance over the 3-month follow-up period. In addition, the stroke patients gave a higher quality score in critical understanding of health management exhibited significantly improved IADL capability over the 3-month follow-up period (Table 4).

Discussion

The present study revealed three key findings. First, the CTM-15 scores have been reported among general inpatients in a number of countries such as the US, Sweden, Singapore, Korea, China and Japan,

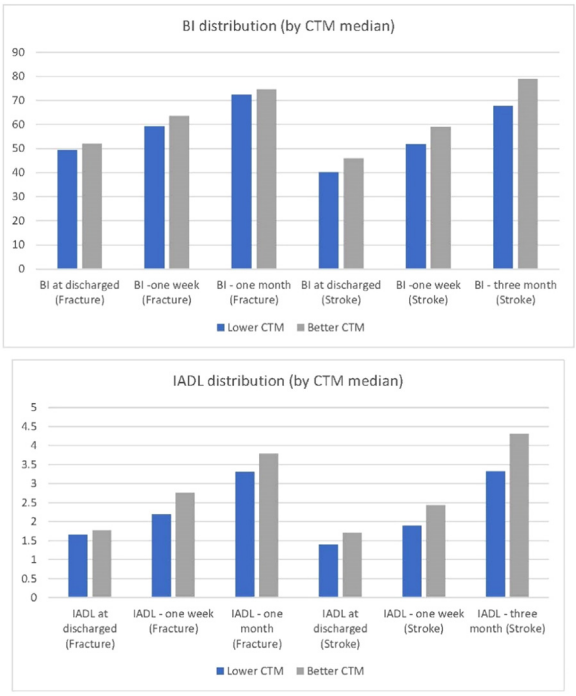

Fig. 1. BI and IADL distribution in stroke and fracture patient.

ranging from 60 to 81.[9,10,14,15,27,35] Relative to the CTM-15 scores reported in other countries, the CTM-15 score observed among stroke and fracture patients in the present study in Taiwan was higher than those in Singapore, Japan and Sweden, but not the US, China and Korea. One plausible interpretation is that the quality of transitional care in Taiwan is, from the perspective of patients, more satisfactory to or at least on par with that provided in other countries. But it is also likely that the different CTM-15 score reported in different countries could merely reflect different perception and demand among patients living in different countries. Second, our findings are consistent with those of other studies[8,9,11] that is, a significant positive relationship exists between favorable post-discharge functional outcome and better perceived quality of transitional care among patients with moderate-severe stroke. Whereas previous studies mostly investigated the influences of quality of transitional care on mortality, readmission, length of stay or subsequent use of emergency department, we added evidence that the influence of transitional care quality on functional outcome measures. In addition, as previous studies mostly targeted cardiovascular patients or patients who were discharged home after hospitalization, our study confirmed the positive impacts of better quality of transitional care on functional outcomes among surgical inpatients who were discharged to care institutions. Relative to other patients, stroke patients have a longer rehabilitation process and require more complex post-discharge self-management, information, and support from care providers at discharge, which are crucial to their long-term functional outcome. The observed significant positive effects of specific domains (i.e., key understanding of medication, understanding of self-care management, confidence in self-management skills, and confidence in managing patient's health or one's personal health) suggest the key role of increasing one's levels of crucial knowledge and increasing one's confidence in the functional outcomes of stroke patients. An improved quality of transitional care may enhance the self-care capability of stroke patients and their caregivers, and reduce the uncertainty associated with post-discharge care management; consequently, they feel more at ease during the care transition and experience enhance functional recovery. This relationship was revealed to be more pronounced for more complex IADL. Nevertheless, the greater complexity in care needs and self-care management in stroke patients than those in fracture patients might have led to a higher dropout rate among the stroke participants in this study. Furthermore, we shall also attend to the role and needs of home caregivers or family members of these patients. Some stroke patient may experience a certain extent of brain damage that may influence not only their physical but mental health, which may hinder the access to rehabilitation or progress. And it may also add to care burdens caregivers, therefore, strengthening understanding and confidence of home caregivers and family members of stroke patients in care management in care transition shall not be overlooked. Third, although no significant association was observed between overall care transition quality and functional outcomes among the fracture patients, specific quality domains of care transition, particularly incorporation of patient's or caregiver's preference and effective communication and information sharing between patients, caregivers, and medical providers, did yield significant influences on patient's IADL status. Similar to the findings of other studies, suggesting the importance of information sharing between family caregivers and healthcare provider in reducing the

Table 3
Long-term functional status between different level of overall CTM-15 and specific factors among fracture patients.

	Fracture BI				Fracture IADL			
	Parameter Estimate	P-value	95% CI		Parameter Estimate	P-value	95% CI	
CTM								
≦ Median	ref				ref			
> Median	0.89	0.65	−2.93	4.70	0.25	0.10	−0.05	0.55
Factor_1								
Lower (≦ Median)	ref				ref			
Higher (> Median)	1.91	0.33	−1.96	5.77	0.14	0.39	−0.18	0.46
Factor_2								
Lower (≦ Median)	ref				ref			
Higher (> Median)	2.22	0.25	−1.53	5.98	0.35	0.03	0.03	0.66
Factor_3								
Lower (≦ Median)	ref				ref			
Higher (> Median)	0.64	0.75	−3.26	4.54	0.18	0.26	−0.14	0.50
Factor_4								
Lower (≦ Median)	ref				ref			
Higher (> Median)	2.49	0.75	−3.26	4.54	0.33	0.04	0.01	0.64

Note: We adjusted gender, age, SPMSQ, care setting after discharged from hospital, length of stay, primary caregiver, patient's control preference scale and length of follow-up.
Abbreviations: SD, standard deviation; CTM, Care Transition Measure.

Table 4
Long-term functional status between different level of overall CTM-15 and specific factors among stroke patients.

	Stroke BI				Stroke IADL			
	Parameter Estimate	P-value	95% CI		Parameter Estimate	P-value	95% CI	
CTM								
≦ Median	ref				ref			
> Median	4.29	0.29	−3.63	12.21	0.51	0.03	0.04	0.99
Factor_1								
Lower (≦ Median)	ref				ref			
Higher (> Median)	8.08	0.05	0.10	16.07	0.58	0.03	0.05	1.10
Factor_2								
Lower (≦ Median)	ref				ref			
Higher (> Median)	−2.06	0.64	−10.61	6.49	0.29	0.29	−0.25	0.82
Factor_3								
Lower (≦ Median)	ref				ref			
Higher (> Median)	2.78	0.52	−5.61	11.18	0.27	0.27	−0.21	0.74
Factor_4								
Lower (≦ Median)	ref				ref			
Higher (> Median)	9.12	0.52	−5.61	11.18	0.75	0.02	0.13	1.38

Note: We adjusted gender, age, SPMSQ, care setting after discharged from hospital, length of stay, primary caregiver, patient's control preference scale and length of follow-up.
Abbreviations: SD, standard deviation; CTM, Care Transition Measure.

feeling of uncertainty and enhancing the understanding of future care plans,[36,37] our findings revealed that considering the preferences of patients and their caregivers during the care transition process considerably influences the prognosis of patients.

The differences in the effects of transitional care quality on functional outcomes between stroke patients and fracture patients may be due to the differences in the complexity of self-care management following discharge between the two conditions. In contrast to fractures, prognosis and functional recovery of stroke, particularly moderate-severe stroke, is less predictable. Relative to the post-discharge care for patients with fractures, the post-discharge care for patients with stroke tends to have greater clinical uncertainty and involve more complex medications. Thus, medication knowledge and care management knowledge are crucial for patients with stroke. For fracture patients, rehabilitation is essential to functional recovery, and self-motivation and caregivers play key roles in this process.[38] Therefore, considering the preferences of patients and caregivers in care plans and decision-making can help improve the accessibility and effectiveness of rehabilitation. A patient-centered and customized care transition process may be required for special patient subpopulations.[39]

Nevertheless, the effective communication of care plan preparations and formats is crucial for both patients with fractures and patients with stroke. The provision of a readable and easy-to-understand written care plan for future follow-up appointments and care instructions was revealed to be positively associated with the functional outcomes of the patients with fractures and patients with stroke. Providing written information on critical care plans can increase patient adherence to follow-up care appointments for tests, rehabilitation sessions, physician visits, and medication safety. However, it is easier said than done. There are inherent challenges. For example, because patients and caregivers may have varying levels of reading capability and language proficiency, multiple versions of written contents may be needed, which adds to the complexity in discharge planning and resource required. In addition, since after discharge, patients and caregivers may encounter unanticipated care problems, hence, there may the need of continuous adjustment of the care plan. More resources may be required to build in a mechanism to incorporate such flexibility in communication for ensuring seamless care transition.

The present study has several limitations. First, our study was a single-center study. The study site was a large public medical center in Taiwan with extensive experience in treating patients with fractures and stroke. The quality of transitional care in this setting may reflect the upper tier of transitional care in Taiwan. Because of the presumably superior and more homogeneous quality of transitional quality offered in this medical center relative to other centers in Taiwan, the influences of care transition quality observed in the present study may bias toward the null. Second, because of the observational nature of the study, selection bias may be a concern. Although we attempted to control for a set of confounders, we could not fully rule out the possibility of potentially omitted variables (e.g., family, provider, and community factors). Third, the small sample size of the present study is another limitation that prevented us from performing further subgroup analyses. Fourth, we only studied patients with fractures and stroke. Therefore, our findings may not be generalizable to inpatients with other conditions. Fifth, in additional to quality of transitional care, other important factors such as family support and encouragement, and individual determination could have also impacted patient's recovery. However, due to data limitations, we were not able to explore the influences of family-related factors and individual personality or determination on patient's recovery. Future research may help to contribute in this regard. Finally, because of the health conditions of our patients, some patients could not personally respond during the interviews, and their family members or caregivers were required to act as proxies. However, as the role of family member and caregiver have considerable influences on patient's prognosis, their needs and readiness shall not be overlooked by health care providers.[39]

Conclusions

Overall, the present study clearly demonstrated the longitudinal relationship between transitional care quality and functional outcomes over the first 1–3 months in patients with fractures and stroke. Effective communication, the provision of adequate information provision, and the incorporation of patient/caregiver preferences in care plans are crucial to enhancing self-care capability and reducing uncertainty among patients and caregivers. We also examined the differences in the effects of specific quality domains of transitional care between patients with fractures and patients with stroke, and our results suggest that a one-size-fits-all design for transitional care is not optimal. A patient-centered and customized care transition process may be required for each patient subpopulation.[39]

Declaration of Competing Interest

None.

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