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A cross-sectional study of readiness for discharge, chronic illness resources and postdischarge outcomes in patients with diabetic foot ulcer

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Abstract

Aim: To investigate the correlation of readiness for hospital discharge, the chronic illness resources, and postdischarge outcomes of diabetic foot ulcer patients, which can be help for discharged patient rehabilitation.

Design: A cross-sectional study.

Methods: One hundred and seventy-nine patients were recruited from the Endocrinology units of two tertiary hospitals between November 2018–September 2019, in Guangdong, China. The methods used were Readiness for Hospital Discharge Scale, The Chronic Illness Resources Survey and one-on-one telephone interviews.

Results: Pearson correlation coefficients indicated moderate correlation between the readiness for discharge and resource availability for chronic illnesses ($r = .446$, $p < .001$). Multiple linear regression analysis showed that Chronic Illness Resources Survey, self-care ability, methods of wound treatments after discharge, and living alone were the main predictors of readiness for hospital discharge among diabetic foot ulcer patients ($F = 12.272$, $p < .001$, $R^2 = .621$, $R^2_{ad} = .571$). The study was limited by location, patient's recall bias and lack of BADL scale, which can be further improved in subsequent studies by developing multi-centre clinical study and adopting more objective assessment tools.

KEYWORDS
chronic illness resources, diabetic foot ulcer, hospital readmission, readiness for hospital discharge

1 | INTRODUCTION

Diabetic foot ulcers (DFU) are the most serious chronic complications of diabetes, which causes a high rate of morbidity, mortality and cost (Bus et al., 2016). It is estimated that 10% of people with diabetes will have a diabetic foot ulcer at some point in their lives (Bus et al., 2016). In China, the annual incidence of diabetic foot ulcers is 8.1%, and most of the patients need to be hospitalized to get

appropriate treatment (Xue & Zou, 2019). With the focus of minimizing hospital stays, many patients with diabetic foot ulcers only have their condition controlled when they are discharged from the hospital, but the wound has not completely healed (Ban et al., 2014; Xue & Zou, 2019). If patients are not ready for discharge and do not receive the necessary community resources to continue treatment, it will increase the risk of delayed wound healing and/or infection that can affect their health outcomes and delay recovery (Raspovic & Wukich, 2014; Siow et al., 2019).

2 | BACKGROUND

A patient's readiness for hospital discharge (RHD) is defined as the patient's assessment of their own fitness for discharge and their ability to cope with their illness at home (Fenwick, 1979; Weiss et al., 2007; Weiss & Piacentine, 2006). The decision regarding when to discharge a patient can be complex. It is not only a matter of whether patients are ready, but it is also an issue of the safety of patients after discharge (Coffey & McCarthy, 2013). The medical staff can rate patient's readiness for discharge higher than patients rate themselves. The medical staff judges whether a patient is ready for discharge based on clinical criteria; however, some patients can feel that they do not receive adequate information about the disease and treatment plan. Patients are seldom involved in the formulation of discharge plans at the time of discharge (Coffey & McCarthy, 2013; Hegney, 2010; Siow et al., 2019). Some patients think that the discharge time provided by the hospital is too early for them to make adequate preparations for in-home recovery. Patients with a lower self-reported RHD highlighted that they not only bear the physical and emotional effects of their chronic illness, but have trouble coping with their conditions at home (Siow et al., 2019). Several studies found that patients with low self-perceived discharge preparation may have higher rates of readmission, unplanned medical resource expenses and more adverse complications (Coffey & McCarthy, 2013; Kaya et al., 2018; Weiss et al., 2019). Patients with a lower socioeconomic status were associated with a lower RHD (Siow et al., 2019; Weiss et al., 2007). Nurses and other healthcare providers need to understand the preparedness of patients at the time of discharge to improve continuity between care settings.

High-quality discharge education of chronic disease management resources is crucial for the patient's continuing disease management and quality of life (Glasgow et al., 2000), especially for diabetic foot patients who still need wound dressing and self-management after discharge (Ban et al., 2014). At present, there are few studies on chronic disease resource support in patients with diabetes in China, most of which are concentrated on a single resource that lacks specifics for patients with diabetes. The Pyramid model of social-ecological support resources, which was developed by Glasgow (Glasgow et al., 2005), can help us to evaluate the patients' disease management resources comprehensively. This model covers a wide range of resources that affect the management of chronic diseases from the perspective of social ecology, including not only lifestyle support, but also resources in disease management, such as family, friends, neighbourhoods, communities and media policies (Glasgow et al., 2005). The Chronic Illness Resources Survey (CIRS) is a tool to measure multiple levels of resources for self-management in people with chronic illness. CIRS derived from the pyramid model overcomes the disadvantage of the previous assessment tools which were limited to a certain area of resource support. Recent studies showed that CIRS has been successfully applied to diabetes education programs abroad (Eakin et al., 2007; Sato et al., 2020); however, CIRS has not been used in China for diabetic foot patients, so the relationship between RHD and the utilization of available chronic illness resources is not clear at the present time. Given the limited research conducted in diabetic foot patients, more evidence is needed to understand the experiences of these patients and find an effective approach to improve discharge planning. This study was so designed to investigate the correlation of readiness for hospital discharge, the chronic illness resources and postdischarge outcomes of diabetic foot patients in China, which can be help for discharged patients rehabilitation.

2.1 | Aim

This study aims to answer the following question:

1. Do readiness for hospital discharge, the chronic illness resources and postdischarge outcomes of diabetic foot patients in China correlate?
2. How to improve the recovery of discharged patients with diabetic foot ulcer?

3 | THE STUDY

3.1 | Design

For this cross-sectional study, we recruited eligible diabetic foot patients from two hospitals in Guangdong province, China. The two hospitals serve approximately 4,000 patients with diabetes within the district area, and they admit almost 300 diabetic foot patient each year. The study lasted one year from November 2018–September 2019. The patients were hospitalized in the department of endocrinology.

For this study, we used convenience sampling. One hundred and eighty-one participants diagnosed as diabetic foot inpatients were enrolled in the study. For patients to be eligible, they had to meet the following criteria: (a) definitely diagnosed as diabetic foot inpatients; (b) adults aged ≥18 years; (c) hospitalized at least 3 days and selected for discharge; (d) were able to be contacted by phone for follow-up; (e) were able to provide informed consent. Patients were excluded who had terminal illness or severe mental illness. There were 27 variables in our study: nine related to social demographic data; nine related to disease-related data; three related to

the RHDS; and six related to CIRS. Kendall's sample size calculation principle yields sample sizes five to ten times the number of variables (Bacchetti & Leung, 2002). We set the sample size to 162–324 ($27 \times 5 \times 1.2 = 162$).

3.2 | Method

Two research assistants, who were diabetes specialist nurses, were trained to administer the questionnaires and conduct telephone interviews. The eligible patients who consented to participate in this study were asked to fill out three 30-min questionnaires on the day of their discharge, which included their socio-demographic, their readiness for hospital discharge, and the availability of health resources. The telephone interviews were conducted on the 30th day after discharge to gather postdischarge information, such as the treatment of foot ulcers, 30-day hospital readmissions and 30-day emergency department (ED) visits (Kaya et al., 2018).

3.2.1 | Measurements

Socio-demographic questionnaire
According to the treatment status of diabetic foot patients during hospitalization, we designed the questionnaire to include the following demographical information and medical history of the patients: gender, age, educational level, marital status, living alone, residential area, family economy, payment methods, duration of diabetic, hospitalization history, diabetic foot history, Wagner classification, duration of diabetic foot wound before this visit, complications, self-care ability, length of stay, methods of wound treatments after discharge and 30-day hospital readmission. The Wagner classification is currently one of the most commonly used classification systems. This classification includes cases with risk factors as well and consists of grades from 0–5 based on presence, depth, infection status and gangrenes of ulcer (Erdogan et al., 2018). Self-care ability is a term that refers to a person's ability to carry out self-care activities (Denyes et al., 2001). In this study, patients evaluated their self-care ability according to the life activities completion of their daily such as eating, dressing, going to the toilet, bathing, grooming, walking and so on (Shah et al., 1989). Complications were measured and diagnosed by endocrinologist, included mainly of diabetic retinopathy, diabetic neuropathy, diabetic nephropathy, hypertension and coronary heart disease. Methods of wound treatments after discharge included (a) the wound healed when he left the hospital; (b) outpatient wound treatment; (c) return home for dressing change + regular outpatient review until the wound heals; and (d) return to local hospital for treatment.

Readiness for Hospital Discharge Scale (RHDS)
The scale originally developed by Weiss had been widely used abroad to assess the discharge readiness of patients with different diseases.

It had four dimensions with 22 items (Weiss et al., 2007; Weiss & Lokken, 2009). This study used the Chinese version of the RHDS, which was translated and revised by Lin et al. (2014), to measure patients reported RHDS. It comprised 12 items and three dimensions: personal status (three items), coping ability (five items) and anticipatory support (four items). The scale adopted a scoring method of 0–10 points, and the total scores ranged from 0–120 with the higher scores indicating the patient's discharge preparation was better (Lin et al., 2014). In addition, the total score was graded as low = 0–72, moderate = 72–96 and high = 97–120, respectively. Several studies demonstrated that the scale had good internal consistency (Lin et al., 2014; Wang et al., 2017). In this study, the internal consistency for both the overall scale and three dimensions were 0.91, 0.92, 0.94 and 0.86, respectively.

The Chronic Illness Resources Survey (CIRS)
The CIRS was first developed by Glasgow in 2000 to measure the multiple social resources which affect the self-management of patients with chronic disease, including diabetes (Glasgow et al., 2000). The questionnaire comprised a detailed scale of 65 items and a simple scale of 29 items (Glasgow et al., 2000). In 2005, Glasgow et al. revised the questionnaire into 22 items. In 2015, Zhong et al. introduced a translated and revised Chinese version of CIRS with 19 items and six dimensions which included healthcare team, family and friends, personal coping, neighbourhood or community, media and policies, and organizations. Zhong et al. (2016) found that the scale had good reliability and validity. This scale was a five-point ordinal scale (1–5) with a maximum score of 95 points. The higher the score, the more support the individual received and the higher level of resource utilization (Zhong et al., 2014). The average score of each item was graded 1–3 if the utilization of community resources was not ideal and 3–5 if the utilization of community resources was relatively ideal (Zhong et al., 2014). In this study, the overall Cronbach's α coefficient of .91 was reported for the total and .61–.90 for the subscales.

3.3 | Analysis

No missing data and loss to follow-up data were included in our study. We used the SPSS 20.0 statistical software (IBM, Inc.) for the collected data and set the level of significance as .05. Descriptive statistics were presented as frequency, percentage, mean and standard deviation. We introduced the standardized mean since the number of items per dimension differed in other studies in the two scales (RHDS and CIRS); therefore, dimension scores were normalized as follows: standardized mean = dimension's total score/number of entries in that dimension (Qiu et al., 2019). *T* test and ANOVA were applied to examine the difference of RHDS among socio-demographic variables. Pearson correlation analysis was used to analyse the correlation between the discharge readiness and the resource utilization of chronic diseases of diabetic foot patients. Multiple linear regression analysis was used to explore the predictors of RHDS.

3.4 | Ethics

The study adhered to Declaration of Helsinki and it was approved by the Ethics Committee (No: 2019260). The patients received information about the study and were notified that participation was voluntary. The patients provided written informed consent before data collection.

4 | RESULTS

One hundred and seventy-nine participants completed the study. Two patients were excluded because of terminal illness. No missing data and loss to follow-up data were included in our study. The mean score of the participants in this study in the RHDS was 94.93 (SD 18.39, ranging from 34–120). According to the standardized mean, the dimension index average score from high to low in turn was anticipatory support (7.74 ± 1.59), personal status (7.59 ± 1.46) and coping ability (6.24 ± 2.38). In total, 24.02% of participants demonstrated low level of RHD, 46.93% of them had moderate level of RHD and 29.05% of them had high level of RHD (Table 1).

Most of the patients were male (56.42%), and the mean age was 67.02 years (SD 12.46, ranging from 30–93 years). 36.31% of patients lived in provincial capitals and prefecture-level cities. 51.96% had illiterate or primary education. 89.39% were married, and 69.27% were unemployed. 94.97% lived with family or friends, and 82.12% had medical insurance. The mean length of diabetes was 9.00 years (SD 7.38, ranging from 0.2–40 years). 63.69% had a history of hospitalization, and 71.51% had no diabetic foot history. 30.83% were Wagner level 3 with the course of diabetic foot for more than 7 days, and 89.82% had diabetic complications. 59.22% of patients surveyed had basic self-care ability. Their mean hospital stay was 18 days (ranging from 4–50 days), and 38.55% returned home to treat the foot ulcers by themselves until the wound healed. 76.54% did not visit the emergency departments or were readmitted to hospital after 30 days discharge. The readiness for hospital discharge among socio-demographic characteristics are listed in Table 2. The results of ANOVA and t test showed that the readiness for hospital discharge was significantly different among patients with different states of gender, age, long-term residence, education level, living

alone, employment, Wagner classification, complications, self-care ability and methods of wound treatments after discharge ($p < .05$). LSD post hoc test was performed on the items with more than three groups and $p < .05$. The results of LSD post hoc test shown that the age group of 70–93 was significantly different from other groups; the educational level group of secondary was significantly different from other groups; the Wagner classification group of 4 was significantly different from other groups; the self-care ability subgroup was all significantly different from other two subgroups; the methods of wound treatments after discharge group of return to local hospital for treatment were significantly different from other groups (Table S1).

The mean score of the participants in the study in the CIRS was 55.25 (SD 11.43, ranging from 31–95). Each dimension index average score from high to low in turn was as follows: healthcare team (4.34 ± 0.65), family and friends (2.97 ± 0.87), media and policies (2.88 ± 0.86), personal coping (2.79 ± 0.92), neighbourhood or community (2.51 ± 0.71) and organizations (2.25 ± 0.78). In total, 60.34% of participants expressed that the utilization of community resources was not ideal (Table 3).

Correlation analysis indicated that a moderate statistically significant correlation was found between the RHDS and CIRS ($p < .001$) (Table 4).

In the multiple linear regression analysis, we firstly used the stepwise method for other independent variables, including the age and CIRS. Second, we dummied the statistically significant variables in socio-demographic data, including gender, long-term residence, education level, living alone, employment, Wagner classification, complications, self-care ability and methods of wound treatments after discharge. The dummy variables of each group were guaranteed to be analysed with enter method. Finally, we found that CIRS, self-care ability, living alone and methods of wound treatments after discharge were the main predictors of readiness for hospital discharge ($F = 12.272$, $p < .001$, $R^2 = .621$, $R^2_{ad} = .571$) (Table 5). The data of the multiple linear regression analysis indicated that the CIRS, self-care ability, methods of wound treatments after discharge and living alone could explain 57.1% of patients' discharge readiness. Patients with higher CIRS, better self-care ability, methods of wound treatments after discharge that were not returned to the local hospital and those who did not live alone had a better readiness for hospital discharge.

TABLE 1 Mean scores of Readiness for Hospital Discharge Scale (N = 179)

Variables	Mean ± SD	Mean ± SD (standardized)	N (%)
Anticipatory support	30.95 ± 6.37	7.74 ± 1.59	
Personal status	22.78 ± 4.38	7.59 ± 1.46	
Coping ability	31.20 ± 11.92	6.24 ± 2.38	
Total RHDS	94.93 ± 18.39	7.91 ± 1.53	
Low			43 (24.02)
Moderate			84 (46.93)
High			52 (29.05)

TABLE 2 The socio-demographic characteristics and the comparison of the readiness for hospital discharge among socio-demographic characteristics (N = 179)

Characteristic	N (%)	RHDS (Mean ± SD)	t/F	p
Gender				
Male	101 (56.42)	88.92 ± 17.61	3.397	.001
Female	78 (43.58)	79.77 ± 18.21		
Age (years)				
30–49	17 (9.50)	97.88 ± 15.32	13.31	<.001
50–69	80 (44.69)	89.06 ± 18.43		
70–93	82 (45.81)	78.22 ± 16.37		
Long-term residence				
Provincial capitals and prefecture-level cities	65 (36.31)	89.28 ± 16.90	2.842	.039
County-level cities	51 (28.49)	85.47 ± 20.71		
The villages and towns	35 (19.55)	80.66 ± 18.09		
rural	28 (15.65)	79.21 ± 15.58		
Educational level				
Illiterate	24 (13.41)	74.17 ± 19.78	10.532	<.001
Primary	69 (38.55)	79.38 ± 15.85		
Secondary	38 (21.23)	87.00 ± 18.17		
High school	36 (20.11)	96.06 ± 14.94		
Bachelor's degree or higher	12 (6.70)	98.50 ± 14.66		
Marital status				
Unmarried	5 (2.79)	97.80 ± 17.38	1.853	.16
Married	160 (89.39)	85.00 ± 17.96		
Divorce or widowhood	14 (7.82)	79.50 ± 22.30		
Living alone				
No	170 (94.97)	85.75 ± 18.06	2.616	.010
Yes	9 (5.03)	69.56 ± 18.96		
Employment				
Unemployed	148 (69.27)	81.78 ± 17.94	−6.928	<.001
Employed	31 (17.32)	100.00 ± 12.13		
Household per capita monthly income (yuan)				
<1,999	21 (11.73)	86.71 ± 20.33	2.157	.095
2,000–3,999	109 (60.89)	82.45 ± 17.01		
4,000–5,999	38 (21.23)	88.37 ± 20.66		
>6,000	11 (6.15)	94.27 ± 16.60		
Payment methods				
Public expense	3 (1.68)	93.33 ± 7.37	1.504	.215
At own expense	29 (16.20)	84.66 ± 14.05		
Medical insurance	147 (82.12)	86.60 ± 18.72		
Duration of diabetes (years)				
0.2–1.5	24 (13.04)	83.04 ± 15.41	0.523	.719
2–5	46 (25.69)	83.20 ± 18.42		
6–10	67 (37.43)	86.97 ± 19.94		
10–15	15 (8.40)	87.67 ± 17.98		
≥16	27 (15.08)	83.00 ± 17.55		
Hospitalization history				

TABLE 2 (Continued)

Characteristic	N (%)	RHDS (Mean ± SD)	t/F	p
No	65 (36.31)	85.88 ± 16.61	0.517	.605
Yes	114 (63.69)	84.39 ± 19.38		
Diabetic foot history				
No	128 (71.51)	84.91 ± 17.45	−0.031	.976
Yes	51 (28.49)	85.00 ± 20.75		
Wagner classification				
1	12 (6.71)	99.50 ± 10.41	6.412	<.001
2	54 (30.17)	88.69 ± 17.76		
3	79 (44.13)	83.90 ± 18.18		
4	34 (18.99)	76.24 ± 17.88		
Duration of diabetic foot wound before this visit (days)				
1–7	28 (15.79)	90.21 ± 14.87	1.012	.389
8–30	60 (30.83)	84.50 ± 17.14		
31–60	34 (21.05)	84.74 ± 15.63		
≥61	57 (32.33)	82.91 ± 22.29		
Complications				
No	20 (11.18)	94.55 ± 14.43	2.518	.013
Yes	159 (89.82)	83.72 ± 18.52		
Self-care ability				
Need more help to take care of themselves	7 (3.91)	61.57 ± 12.92	52.446	<.001
Basically self-care	106 (59.22)	77.70 ± 15.74		
Complete self-care	66 (36.87)	99.03 ± 12.83		
Length of stay (day)				
4–7	24 (13.41)	90.08 ± 16.68	0.96	.431
8–14	54 (30.17)	85.04 ± 17.54		
15–21	43 (24.02)	82.00 ± 20.20		
22–28	32 (17.88)	86.91 ± 17.67		
29–59	26 (14.52)	82.38 ± 19.40		
Methods of wound treatments after discharge				
The wound healed when he left the hospital	29 (16.20)	89.03 ± 13.05	3.536	.016
Outpatient wound treatment	64 (35.75)	85.92 ± 18.66		
Return home for dressing change + regular outpatient review until the wound heals	69 (38.55)	85.49 ± 19.80		
Return to local hospital for treatment	17 (9.50)	71.95 ± 14.60		
30-day hospital readmission				
No	137 (76.54)	85.38 ± 18.30	0.586	.559
Yes	42 (23.46)	83.48 ± 18.83		

5 | DISCUSSION

5.1 | Readiness for hospital discharge of diabetic foot patients

Only 75.98% of patients in this study felt that they were ready for hospital discharge, which is much lower than in other international studies (Qiu et al., 2019; Wang et al., 2017; Weiss et al., 2007). Compared with the Chinese diabetic patients with no foot ulcers where the standardized mean score was 8.20 (Xu et al., 2017), the standardized mean score in our study was 7.91, which was significantly lower ($p < .05$). This finding enriches the current knowledge about diabetic foot patients and might indicate that patient readiness for hospital discharge is inadequate. Among the three dimensions, "coping ability" had the lowest score, which may be interpreted by that diabetic foot patients had not yet adapted to the transfer of care responsibilities, with the wound had not healed when they were discharged from the hospital. In addition, most of them had

TABLE 3 Mean scores of the Chronic Illness Resources Survey (N = 179)

Variables	Min–Max	Mean ± SD	Mean ± SD (standardized)	<3 score (N, %)	≥3 score (N, %)
Healthcare team	6–15	13.03 ± 1.94	4.34 ± 0.65	3 (1.68)	176 (98.32)
Family and friends	2–10	5.93 ± 1.74	2.97 ± 0.87	78 (43.58)	101 (56.42)
Media and policies	4–15	8.63 ± 2.57	2.88 ± 0.86	93 (51.96)	86 (48.04)
Personal coping	3–15	8.37 ± 2.77	2.79 ± 0.92	87 (48.60)	92 (51.40)
Neighbourhood or community	6–25	12.53 ± 3.55	2.51 ± 0.71	138 (77.09)	41 (22.91)
Organizations	3–15	6.76 ± 2.33	2.25 ± 0.78	151 (84.36)	28 (15.64)
Total CIRS	31–95	55.25 ± 11.43	2.91 ± 0.60	108 (60.34)	71 (39.66)

TABLE 4 Correlation between readiness for hospital discharge and the chronic illness resources (N = 179, r)

Variables	Healthcare team	Family and friends	Personal coping	Neighbourhood or community	Media and policies	Organizations	Total CIRS
Personal status	.275**	.175**	.240**	.314**	.419**	.129	.349**
Coping ability	.027	.11	.372**	.423**	.378**	.274**	.383**
Anticipatory support	.350**	.356**	.206**	.205**	.354**	.11	.329**
Total RHDS	.204**	.236**	.369**	.420**	.468**	.247**	.446**

**p < .001.

foot ulcers defined as Wagner three, which may require more wound treatment skills. 51.96% of patients had very little health education, so it was not easy for them to acquire sufficient understanding of how to dress wounds and grasp critical discharge educational guidance for self-treatment (Lau et al., 2016). Thus, understanding how diabetic foot patients experience transitioning from hospital care to self-management is important for improving the discharge process (Namavar et al., 2016).

5.2 | Postdischarge outcomes among diabetic patients

The study showed that only 16.20% of patients' wounds healed when they were discharged from the hospital. Most of them needed to continue home wound treatment, combined with regular reviews by doctors or nurses. This finding was similar to other diabetic foot studies (Ban et al., 2014; Xue & Zou, 2019) in China. Due to the long treatment time, the shortage of hospital beds and the heavy financial burden (Xue & Zou, 2019), most patients would prefer to go home and continue self-wound treatment for further recovery.

Evidence showed that readiness for hospital discharge is an important predictor of readmission (Kaya et al., 2018; Weiss et al., 2019; Xu et al., 2019) However, in this study, the score of readiness for hospital discharge had no significance between the patients who were readmitted during 30 days postdischarge and those who were not readmitted (p > .05). This discrepancy may be due to the fact that most of the patients had a prior history of hospitalization, and they objectively recognize that recovery from diabetic foot

ulcers is a long-term process. They are aware of the necessity of readmission to the hospital if they do not properly treat the wound at home; however, when we asked patients if they were readmitted, we only asked if they were admitted for foot ulcers, and we did not assess other possible reasons for readmission, such as weakness or functional impairment.

5.3 | The chronic illness resources of diabetic foot patients

The results revealed that most of the patients' overall ability to obtain resources after discharge was not ideal, which was similar to many other studies (Coffey & McCarthy, 2013; Glasgow et al., 2005; Wang et al., 2013). 51.96%–84.36% patients had scores <3 in the dimension of media and policies, neighbourhood or community, and organizations, which could be related to the age and the wound. The mean age of this study was 67.02 years (SD 12.46), and as age increases, the ability to accept and understand media or policies will also decline (Zhong et al., 2016). Transport inconvenience caused by foot wounds will further limit the communication with neighbourhood or community and the utilization of resources, such as travelling to the pharmacy. In addition, although there is more publicity about diabetes management in China, there are few public diabetes organizations or groups to join. Individual free lectures organized by communities are a mere formality and attract very little attention from diabetes patients (Zhong et al., 2014). However, evidence showed that having access to social and physical resources has a positive influence on the self-management behaviour of patients with diabetes in the

TABLE 5 Multiple liner regression coefficients among readiness for hospital discharge, socio-demographics variables, and chronic illness resources (N = 179)

Variables	B	SE	Beta	R^2_{ad}	t	p	B's 95% CI
Constant	56.285	10.701			5.260	<.001	35.148–77.421
CIRS	10.385	1.644	.340	.194	6.318	<.001	7.138–13.632
Self-care ability							
Need more help to take care of themselves	−26.817	5.356	−.283	.540	−5.006	<.001	−37.396 to −16.237
Basically self-care	−13.702	2.277	−.367		−6.017	<.001	−18.200 to −9.204
Methods of wound treatments after discharge							
The wound healed when he left the hospital	12.907	4.050	.259	.558	3.187	.002	4.908–20.906
Outpatient wound treatment	8.962	3.485	.234		2.572	.011	2.079–15.846
Return home for dressing change + regular outpatient review until the wound heals	9.797	3.398	.260		2.883	.004	3.086–16.509
Living alone	−10.116	4.337	−.121	.571	−2.332	.021	−18.683 to −1.549

Note: F = 12.272, p < .001, R^2 = .621, R^2_{ad} = .571.

community (King et al., 2010). The better patients utilize chronic disease resources, their self-management at home will be more successful (Kurnia et al., 2017). Thus, we can use this questionnaire to evaluate the support resources, identify the weak parts, and then give targeted guidance to make good use of potential resources to improve patients' disease management.

5.4 | Predictors of readiness for hospital discharge among diabetic foot patients

Our study found that CIRS, self-care ability, methods of wound treatments after discharge, and living alone were the main predictors of readiness for hospital discharge. Correlation analysis also verifies positive correlation between RHD and CIRS for patients who had diabetic foot ulcers. This was similar to Coffey's study (Coffey & McCarthy, 2013). Research has found that adequate community support can be essential for people with chronic illnesses going home following a hospital stay (Coffey & McCarthy, 2013). Restricted access to services and community support is also associated with a higher rate of readmission (Kurnia et al., 2017). The acceptance of chronic illness resources support can vary among diabetic foot patients; therefore, healthcare professionals need to assess an individual's need for support after discharge.

In this study, some socio-demographic factors such as self-care ability, wound treatment after discharge, and living alone, were defined as predictors of readiness for hospital discharge. Among these variables, the impact of self-care ability after discharge was much higher than the other variables, which explained the variation of 34.6% of readiness for discharge scores. Patients with higher self-care ability had more confidence and energy in treating challenges at home (Weiss et al., 2017). Patients whose wounds were healed

are better prepared for discharge compared with those who go back home and treat their wounds by themselves. This indicates that patients with higher Wagner classification wounds had a lack of confidence in treating their wound at home. Thus, it is very important to improve the referral of hospitalization wound plan and improve patients' self-wound care education before discharge (Li et al., 2017). Living alone was also associated with lower readiness for discharge scores, which is consistent with Weiss's findings (Weiss et al., 2007). In contrast with those patients who live with family or friends, patients who lived alone had a lack of family support, indicating the need for continuity of care during the transition from hospital to home or community-based care.

5.5 | Limitations

There were some limitations in this study. First, this study was based on a convenience sample obtained from two tertiary hospitals in Guangdong. The participants' socio-demographic characteristics of the sample may be different from those who did not participate in this study, which would affect the generalization of the conclusions. Second, as the variables of 30 days hospital readmission and 30 days emergency department (ED) visits were retrieved from the participants' recall during a telephone interview, this study may face the risk of recall bias. Third, we did not use the scale of basic activities of daily life (BADL) to verify the patients' reported self-care abilities further. This may cause patients who were not ready for discharge to exhibit lower abilities of self-care and lead to bias in the results. Therefore, randomized sampling, selecting a sample from every hospital level, and adopting more objective assessment tools are recommended for future studies to guarantee greater representation.

6 | CONCLUSION

In summary, to improve patient outcomes, it is necessary to have a discharge planning procedure to insure the readiness for discharging diabetic foot patients who live alone or need more help at home with wound care and/or more help accessing health resources.

CONFLICT OF INTEREST
No conflict of interest has been declared by the authors.

AUTHOR CONTRIBUTIONS
All those listed as authors should qualify for authorship according to the following criteria:

1. Have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data;
2. Been involved in drafting the manuscript or revising it critically for important intellectual content;
3. Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; and
4. Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

DATA AVAILABILITY STATEMENT
The data of our manuscript can be obtained by email to the first author for legitimate reasons.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.