



## ORIGINAL ARTICLE

# Factors influencing career success of clinical nurses in northwestern China based on Kaleidoscope Career Model: Structural equation model

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## Funding information

Key Research and Development Plan of Shaanxi Province, Grant/Award Number: 2020SF-280

## Abstract

**Aim:** To explore the relationships among self-efficacy, information literacy, social support and career success of clinical nurses and identify factors influencing clinical nurses' career success in northwestern China.

**Background:** Understanding the influencing factors of career success is important for the professional development of nurses and the improvement of clinical nursing quality. Many influencing factors of career success have been identified, but there is no large-scale research on the relationships among self-efficacy, information literacy, social support and career success of clinical nurses based on Kaleidoscope Career Model. Studies examining the association of the four factors remain limited.

**Methods:** A total of 3011 clinical nurses from 30 hospitals in northwestern China were selected in the cross-sectional survey, and the response rate was 94.71%. The clinical nurses completed the online self-report questionnaires including self-efficacy, information literacy, social support rating scale and career success scale. The data were analysed by SPSS23.0 statistical software using t test, analysis of variance, Pearson's correlation and multiple linear regression. Structural equation model (SEM) was used to analyse the influencing factors of career success using Mplus 8.3.

**Results:** The career success of clinical nurses in northwestern China was at a medium level. The linear multivariate regression analysis showed that self-efficacy ( $\beta = .513$ ), social support ( $\beta = .230$ ), information support ( $\beta = .106$ ), information consciousness ( $\beta = -.097$ ), information knowledge ( $\beta = .067$ ), information ethics ( $\beta = -.053$ ), hospital grade ( $\beta = .118$ ), marital status ( $\beta = -.071$ ) and age ( $\beta = -.037$ ) entered

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regression equation of clinical nurses' career success (all  $P < .05$ ). SEM results showed that the career success was negatively correlated with demographic characteristics and positively correlated with social support and self-efficacy.

**Conclusion:** Demographic characteristics, self-efficacy, social support and information literacy are the influencing factors of nurses' career success, which should be considered in the process of promoting nurses' career success.

**Implications for nursing management:** Nursing managers need to acknowledge the significance of nurses' career success both for the realization of their own value and for the improvement of clinical nursing quality. They should encourage nurses to enhance self-efficacy and render more social support through incentive policies and foster nurses' information literacy through information technology training so as to improve their career success.

#### KEYWORDS

career success, clinical nurse, information literacy, self-efficacy, social support, structural equation model

## 1 | INTRODUCTION

Nursing is an important part of modern medicine. The stability and development of nursing teams are related to the quality of clinical nursing work (Nibbelink & Brewer, 2018). However, the professional development of nurses has long been a problem, and the shortage of nurses and the high turnover rate have always existed (Wan et al., 2018; Zhang et al., 2019). Studies have reported that the global nurse turnover rate is between 15% and 44%, which varies from country to country (Pang et al., 2020). The turnover of nurses is not conducive to the development of their nursing career and not beneficial to the stability and development of the whole nursing community (Yasir et al., 2020). In recent years, with the progress of medical and health services, China's nursing industry has entered a stage of rapid development (Lu et al., 2018; Wong & Zhao, 2012). Although the development of nursing in China has made great progress, there are still many challenges, such as unstable nursing team and unbalanced resource distribution (Liu et al., 2018; Zhang & Tu, 2020). In northwestern China, the level of medical and health care lags behind compared with that in the East, and nurses have a higher turnover rate (Zhang et al., 2017). Therefore, it is of great significance for clinical nurses in northwestern China to clarify their career planning and promote their career success, so as to reduce the turnover rate of clinical nurses and increase their sense of achievements, which would facilitate the development of the whole nursing enterprise and the improvement of nursing quality (Laschinger et al., 2016).

### 1.1 | Background

Career success refers to a person's accumulated positive work-related achievements or psychological sense of achievement

(Cumbler et al., 2018). At present, most of the researches on career success are concentrated in the field of enterprise management, but gradually, researches have turned to the field of nursing (Brown et al., 2018; Thammasitboon et al., 2017). Researches have showed that career success is helpful to promote the innovative behaviour of nurses, and it can improve the quality of service and stabilize the nursing teams (Wang, Zhang, et al., 2019; Zamanzadeh et al., 2019). A study among nurses in mainland China with master's or doctor's degrees shows that their career success is at a medium level, which was consistent with the research of 460 nurses in Tianjin, China (Dan et al., 2018b; Wang, Zhang, et al., 2019). However, there is no study on the career success of clinical nurses in northwest China.

Self-efficacy refers to the individual's judgement on whether he can successfully accomplish something (Cziraki et al., 2018). Studies have shown that low self-efficacy will have a negative impact on clinical nurses' work performance, mental health and nursing service quality, whereas higher self-efficacy can help nurses better adapt to clinical work, promote individual mental health and career development (Al-Kalaldehy et al., 2019; Wahlberg et al., 2016).

Information literacy refers to the ability to understand, collect, evaluate and utilize information (Boruff & Harrison, 2018). In the era of big data medicine, the information literacy of nurses is directly related to the efficiency of nursing work (Wadson & Phillips, 2018). Good information literacy can help nurses master the frontier dynamic knowledge, quickly collect, find, analyse and utilize data, which will help nurses improve their work efficiency (Wahoush & Banfield, 2014).

Social support means material, mental and daily care and support or help received from colleagues, friends and family (Kelly et al., 2017). Research shows that social support could provide protection to individuals when they are under stress, which has a buffering

effect on striking events. On the other hand, it promotes the maintenance of good emotional experience (Clayton et al., 2019; Wu & Sheng, 2019).

The Kaleidoscope Career Model (KCM) asserts that career success is mainly composed of three factors: challenge, authenticity and balance (Lisa et al., 2018). Challenge is an important driving force for career success. According to Jiao Ye's (Ye et al., 2020) qualitative study, in Chinese culture, standing up to the challenge with different measures, which is also a challenging task, may have an important impact on career success. In our study, it is a great challenge for nurses to master skills of information identification and processing in the intense and heavy clinical work. So, we used information literacy to reflect this parameter. Authenticity means being genuine and correct in understanding of oneself. Research showed that the authentic assessments were conducive to improving self-efficacy (Ommering et al., 2021). In previous studies of Chinese nurses, there was a significant positive correlation between self-efficacy and career success (Dan et al., 2018b). So, we used self-efficacy to reflect this parameter in our study. Balance means the interaction between individual and external environment. In Chinese research, social support is an important aspect of balance (Xia & Yang, 2019). Social support includes both subjective and objective support, which is the representative of internal and external balance. Some studies showed that the nurses' career success was influenced by gender, educational background and organisational support (Liu & Liu, 2016; Zhang & Jin, 2018). However, our study, which was based on KCM, aimed at exploring the career success of nurses in a more efficient manner.

## 1.2 | Aims

This study was designed to examine: (1) the levels of career success, self-efficacy, social support and information literacy; (2) the relationships of career success, self-efficacy, social support and information literacy; (3) factors and the structural model of nurses' career success.

## 2 | METHODS

### 2.1 | Study design

Our study was a multicenter cross-sectional survey. Nurses completed the self-report questionnaires on the network platform.

### 2.2 | Participants

The calculation of sample size is 10 times of the number of items in the scale. There are 67 items in this questionnaire. Therefore,

the calculation formula of sample size is  $N = (6 + 10 + 30 + 10 + 11) * 10 = 670$ , which means that at least 670 subjects are required for this study. We use the convenient sampling method, and 3480 clinical nurses from 5 tertiary hospitals, 7 secondary hospitals and 18 primary hospitals are recruited. According to voluntary principle, 3180 clinical nurses participate in our survey. The inclusion criteria were (1) nurse qualification certificate of the People's Republic of China; (2) engaging in clinical nursing work; and (3) informed consent to participate in the study. We collected 3011 valid questionnaires, and the response rate was 94.71%. There was no significant difference in the demographic composition ratio between the valid questionnaires and the total questionnaires.

### 2.3 | Procedures

This study was conducted in 30 hospitals in northwest China from March to July 2020. Initially, researchers explained the purpose of the survey to the hospital administrators to obtain their approval and support prior to data collection and gave their consent to participate in the research. With the help of head nurses of various departments, questionnaires were sent through email to the clinical nurses. The respondents were given questionnaires to complete within 2 weeks. All the clinical nurses were informed that participation in this study was voluntary. They could withdraw from the study at any time for any reason, and the questionnaires were answered anonymously. They were assured that their information would only be used for research, and the scores of their questionnaires would not have any influence on their career.

### 2.4 | Measurements

#### 2.4.1 | Demographic

Demographic characteristics were designed by the researchers including age, years of working, educational levels, relationship status, hospital level and positions.

#### 2.4.2 | Self-efficacy

The general self-efficacy scale (Chinese version) was translated and revised by Wang Caikang in 2001 (Chen et al., 2019). It has 10 items and is widely used in Chinese with high reliability and validity. In the process of response, '1' means 'completely inconsistent'; '2' means 'basically not conforming'; '3' is 'basically conforming'; and '4' is 'completely conforming'. In our study, the test-retest reliability of the scale was .832, and the half reliability was .828. The Cronbach's alpha coefficient was .951.

### 2.4.3 | Information literacy

The information literacy scale (Chinese version) was translated and adapted by researchers through expert meetings and discussions based on Wadson's information literacy scale (Wadson & Phillips, 2018). The scale has 5 dimensions and 30 items: information awareness (8 items), information knowledge (6 items), information ability (4 items), information ethics (6 items) and information support (6 items). It used Likert's 5-grade scoring method, namely, from 'fully consistent' to 'non-conforming', and the scale was scored from '1 point' to '5 point'. The coefficients of the internal consistency of the whole scale and subscales were over .87. The scale had high content validity and structural validity as well as discrimination validity. In this study, the Cronbach's alpha coefficient of this questionnaire was .957, and the Cronbach's alpha coefficient of the five dimensions ranged from .872 to .939.

### 2.4.4 | Social support

The Chinese version social support rating scale was developed by Xiao Shuiyuan (Xiao, 1999). This scale is widely used in nursing research and has high reliability and validity (Gu et al., 2016; Wang et al., 2018). It has 10 items, including 3 dimensions: objective support (3 items), subjective support (4 items) and utilization degree of social support (3 items). Items 1–4 and 8–10 are scored from '1' to '4' in the order of options. Item 5 is scored from '1' to '4' from 'none' to 'full support'. Items 6 and 7 are multiple topics where each option selected is counted as '1'. In this study, the Cronbach's alpha coefficient of this questionnaire was .821, and the Cronbach's alpha coefficient of the five dimensions ranged from .740 to .818.

### 2.4.5 | Career success

Career success scale was used to assess individual's positive psychological feelings accumulated and obtained in the work, as well as their work achievements (Woolston, 2019). It contains 2 dimensions and 11 items: career satisfaction (5 items) and career competition (6 items). The scale has been widely used in Chinese research and has high reliability and validity (Li et al., 2014; Xin et al., 2020). The Cronbach's alpha coefficient of this study was .947, and the Cronbach's alpha coefficients of the dimension of career satisfaction and career competition were .936 and .917 respectively.

## 2.5 | Data analysis

We adopted IBM SPSS Statistics version 23.0 for Windows to analyse the data. All variables were described by using descriptive statistics. Levene's test was employed to test the variance homogeneity. The

differences of participants' career success in demographic characteristics were compared by independent *t* test and analysis of variance. Pearson's correlation analysis was taken to explore the correlation among career success, self-efficacy, information literacy and social support. Influencing factors of nurses' career success and its two dimensions were identified by using a stepwise multiple linear regression. The structural equation model (SEM) was adopted to analyse the influencing factors of career success, and the measurement and structural models were performed through using Mplus 8.3. All the tests were performed by two-sided test, with  $P < 0.05$  as the statistical difference evaluation standard.

## 3 | RESULTS

### 3.1 | Subjects' characteristics and distribution of career success

Table 1 presented nurses' demographic and work-related characteristics. The average age of the respondents was 30.77 years old ( $SD = 5.78$ ; ranging from 18 to 56 years old), and the average years of working was 8.53 years ( $SD = 6.30$ ; ranging from 1 months to 38 years). There were 237 head nurses and 2774 nurses in our study. Among these nurses, 1278 (42.45%) had junior college's degrees, 1720 (57.12%) had bachelor's degrees and 13 (0.43%) had master's degrees or above.

The differences of participants' career success in demographic characteristics were shown in Table 1. In career success, the study showed significant differences in hospital rank ( $F = 11.730$ ,  $P < .001$ ) and position ( $t = 2.529$ ,  $P = .011$ ). In the dimensions of career satisfaction, the study showed significant differences in hospital rank ( $F = 12.471$ ,  $P < .001$ ) and position ( $t = 3.345$ ,  $P = .001$ ). In the dimensions of career competition, the study showed significant differences in hospital rank ( $F = 10.486$ ,  $P < .001$ ). The scores of nurses' career success and its two dimensions in the secondary hospital were the highest, followed by the tertiary hospital, and the lowest were in the primary hospital. The scores of head nurses' career success and its two dimensions were higher than those of ordinary nurses.

### 3.2 | Self-efficacy, information literacy, social support and career success of study participants

As shown in Table 2, the career success score of clinical nurses in this study was ( $35.56 \pm 8.87$ ), ( $16.75 \pm 4.65$ ) for career satisfaction and ( $18.81 \pm 4.84$ ) for career competition. The score of self-efficacy was ( $25.42 \pm 6.93$ ). The score of information literacy was ( $114.18 \pm 18.62$ ). The score of social support was ( $43.63 \pm 8.57$ ), and its dimension scores were as follows: subjective support ( $24.42 \pm 5.07$ ), objective support ( $10.76 \pm 3.69$ ) and utilization of support ( $8.45 \pm 1.95$ ).

**TABLE 1** The univariate analysis of general information and career success ( $n = 3011$ )

Variables	N (%)	Career satisfaction	Career competition	Career success
Age (years)				
≤25	532 (17.67)	16.61 ± 4.69	18.72 ± 4.95	35.33 ± 9.10
26–30	1165 (38.69)	16.64 ± 4.69	18.72 ± 4.88	35.36 ± 8.96
31–35	774 (25.71)	16.73 ± 4.66	18.88 ± 4.86	35.61 ± 8.95
>35	540 (17.93)	17.16 ± 4.47	18.96 ± 4.64	36.12 ± 8.33
Years of working				
≤2	458 (15.21)	16.70 ± 4.70	18.68 ± 4.82	35.38 ± 8.96
3–5	657 (21.82)	16.55 ± 4.63	18.66 ± 4.92	35.21 ± 8.95
6–10	1062 (35.27)	16.63 ± 4.73	18.76 ± 4.94	35.38 ± 9.10
>10	834 (27.70)	17.09 ± 4.50	19.05 ± 4.67	36.15 ± 8.44
Educational levels				
Junior college	1278 (42.45)	16.94 ± 4.65	18.82 ± 4.85	35.76 ± 8.84
Undergraduate	1720 (57.12)	16.61 ± 4.63	18.80 ± 4.84	35.41 ± 8.89
Master degree or above	13 (0.43)	16.62 ± 5.42	18.15 ± 5.31	34.77 ± 10.47
Relationship status				
Single	809 (26.87)	16.61 ± 4.48	18.93 ± 4.76	35.54 ± 8.65
Married	2175 (72.23)	16.81 ± 4.70	18.76 ± 4.87	35.57 ± 8.93
Widowed or separated	27 (0.90)	15.81 ± 5.34	18.93 ± 5.64	34.74 ± 10.59
Hospital level				
Tertiary hospital	1280 (42.51)	16.35 ± 4.64 <sup>ab</sup>	18.66 ± 4.81 <sup>b</sup>	35.01 ± 8.88 <sup>b</sup>
Secondary hospital	1485 (49.32)	16.92 ± 4.76	18.71 ± 4.97	35.63 ± 9.05
Primary hospital	246 (8.17)	17.82 ± 3.69	20.15 ± 3.96	37.98 ± 7.21
Positions				
Head nurse	237 (7.87)	17.72 ± 4.04 <sup>a</sup>	19.24 ± 4.16	36.95 ± 7.41 <sup>a</sup>
Nurse	2774 (92.13)	16.67 ± 4.69	18.77 ± 4.90	35.44 ± 8.98

<sup>a</sup>Comparison of the first and second items ( $P < .05$ ).

<sup>b</sup>Comparison of the first and third items ( $P < .05$ ).

**TABLE 2** The scores of career success, self-efficacy, information literacy and social support

Scales and dimensions	Minimum	Maximum	Average score	Score
Career success	11.00	55.00	3.23 ± 0.81	35.56 ± 8.87
Career satisfaction	5.00	25.00	3.35 ± 0.93	16.75 ± 4.65
Career competition	6.00	30.00	3.14 ± 0.81	18.81 ± 4.84
Self-efficacy	10.00	40.00	2.54 ± 0.69	25.42 ± 6.93
Information literacy	30.00	150.00	3.81 ± 0.62	114.18 ± 18.62
Information consciousness	8.00	40.00	4.35 ± 0.66	34.76 ± 5.28
Information knowledge	6.00	30.00	3.26 ± 0.88	19.56 ± 5.29
Information capability	4.00	20.00	3.44 ± 0.83	13.74 ± 3.33
Information ethics	6.00	30.00	4.02 ± 0.75	24.09 ± 4.49
Information support	6.00	30.00	3.67 ± 0.83	22.03 ± 4.96
Social support	16.00	66.00	4.36 ± 0.86	43.63 ± 8.57
Subjective support	8.00	32.00	6.11 ± 1.27	24.42 ± 5.07
Objective support	3.00	22.00	3.59 ± 1.23	10.76 ± 3.69
Support utilization	3.00	12.00	2.82 ± 0.65	8.45 ± 1.95

### 3.3 | Relationships among self-efficacy, information literacy, social support and career success

In Table 3, nurses' career success clearly showed a positive correlation with self-efficacy ( $r = .584, P < .001$ ), information literacy ( $r = .148, P < .001$ ) and social support ( $r = .264, P < .001$ ). Career satisfaction was positively correlated with self-efficacy ( $r = .510, P < .001$ ), information literacy ( $r = .127, P < .001$ ) and social support ( $r = .252, P < .001$ ). Career competition was positively correlated with self-efficacy ( $r = .514, P < .001$ ), information literacy ( $r = .150, P < .001$ ) and social support ( $r = .242, P < .001$ ).

### 3.4 | Factors influencing of career success and its dimensions

Career success and its two dimensions were dependent variables, whereas general information, self-efficacy, information literacy and social support were independent variables for multiple linear regression analysis. Table 4 revealed self-efficacy ( $\beta = .513, P < .001$ ), social support ( $\beta = .230, P < .001$ ), objective support ( $\beta = -.057, P = .017$ ), information support ( $\beta = .106, P < .001$ ), information consciousness ( $\beta = -.097, P < .001$ ), information knowledge ( $\beta = .067, P < .001$ ), information ethics ( $\beta = -.053, P < .011$ ), hospital grade (primary hospital,  $\beta = .118, P < .001$ ), relationship status (married,  $\beta = -.071, P < .001$ ) and age (>36 years old,  $\beta = -.037, P = .018$ ) regression ( $R^2 = .359, F = 168.259, P < .001$ ).

### 3.5 | SEM of career success

In Figure 1, referring to the results of multiple linear regression analysis, we built an SEM of career success and verified the hypothesis. In Figure 2, we used confirmatory factor analysis to test whether the index of the measurement model conformed to requirements. The results of confirmatory factor analysis were as follows:  $\chi^2 = 776.509$ ,

$df = 66$ , Comparative Fit Index (CFI) = 0.955, Tucker-Lewis Index (TLI) = 0.938, Standardized Root Mean Square Residual (SRMR) = 0.062, Root Mean Square Error of Approximation (RMSEA) = 0.060. Although the chi-square value was not significant, the other indicators met the requirements, and the model fit well. The larger chi-square degree of freedom ratio was due to the larger sample size (Xie et al., 2018). In structural equation modelling, demographic, social support and self-efficacy had significant impact on career success.

## 4 | DISCUSSION

It is the first multicenter study that analysed the factors influencing of career success of clinical nurses in northwestern China basing on KCM and SEM and explored the relationships among career success, self-efficacy, information literacy and social support. The score of career success of clinical nurses in northwestern China was at an intermediate level across the country which was lower than that of Dan's research of clinical nurses' in eastern China (Dan et al., 2018a). The scores of career success were generally not high, which was related to the occupational fatigue, social status and nurse-patient relationship of clinical nurses in China (Huang et al., 2019; Wang, Lv, et al., 2019; Zhou et al., 2019). The reasons for the low scores of clinical nurses in northwestern China lie in the fact that the level of basic medical facilities is backward, which is a far cry from the eastern region (Liu et al., 2019; Ntekim et al., 2020). Therefore, it is of great significance for us to identify the status of clinical nurses' career success and to explore its influencing factors.

In terms of demographic data, hospital grade, age and marital status were also the influencing factors of career success. In our study, we found that the career success of nurses in the tertiary hospitals was not as great as that in the secondary hospitals and first-class hospitals. This is partly due to the large number of patients and the high work pressure of nurses in the tertiary hospitals (Bateman et al., 2016), which may make the sense of career success of nurses in the tertiary hospitals inferior to that in the lower level hospitals.

**TABLE 3** The correlation between career success and self-efficacy, information literacy and social support

Item	Career success	Career satisfaction	Career competition
Self-efficacy	0.548**	0.510**	0.514**
Information literacy	0.148**	0.127**	0.150**
Information consciousness	0.043**	0.052**	0.029
Information knowledge	0.136**	0.085**	0.167**
Information capability	0.161**	0.123**	0.178**
Information ethics	0.089**	0.089**	0.078**
Information support	0.177**	0.168**	0.163**
Social support	0.264**	0.252**	0.242**
Subjective support	0.253**	0.247**	0.226**
Objective support	0.166**	0.154**	0.158**
Support utilization	0.188**	0.173**	0.178**

\*\* $P < .01$ .

**TABLE 4** Multiple linear regression analysis of career success and its two dimensions of nurses ( $n = 3011$ )

Dependent variable	Independent variable	B	SE	B'	t value	P
Career success <sup>a</sup>	Constant	12.634	1.069	—	11.816	<.001
	Self-efficacy	0.656	0.019	0.513	33.716	<.001
	Social support	0.238	0.027	0.230	8.931	<.001
	Objective support	-0.137	0.057	-0.057	-2.389	.017
	Information support	0.190	0.036	0.106	5.227	<.001
	Information consciousness	-0.163	0.031	-0.097	-5.231	<.001
	Information knowledge	0.112	0.031	0.067	3.653	<.001
	Information ethics	-0.105	0.041	-0.053	-2.530	.011
	Married	-1.398	0.324	-0.071	-4.319	<.001
	Primary hospital	3.824	0.483	0.118	7.924	<.001
	>36 years old	-0.851	0.358	-0.037	-2.376	.018
Career satisfaction <sup>b</sup>	Constant	5.138	0.577	—	8.912	<.001
	Self-efficacy	0.316	0.011	0.471	29.829	<.001
	Social support	0.115	0.014	0.212	7.944	<.001
	Objective support	-0.081	0.031	-0.064	-2.583	.010
	Information support	0.104	0.016	0.111	6.294	<.001
	Information consciousness	-0.080	0.015	-0.090	-5.161	<.001
	Married	-0.575	0.173	-0.055	-3.327	<.001
	Primary hospital	1.873	0.274	0.110	6.843	<.001
	Secondary hospital	0.359	0.149	0.039	2.420	.016
Career competition <sup>c</sup>	Constant	7.344	0.595	—	12.351	<.001
	Self-efficacy	0.338	0.011	0.484	31.136	<.001
	Social support	0.086	0.012	0.152	7.072	<.001
	Support utilization	0.101	0.047	0.041	2.137	.033
	Information support	0.081	0.025	0.089	3.308	.001
	Information consciousness	-0.099	0.017	-0.108	-5.670	<.001
	Information capability	0.085	0.043	0.059	1.978	.048
	Information support	0.067	0.021	0.069	3.278	.001
	Information ethics	-0.084	0.024	-0.078	-3.527	<.001
	Married	-0.825	0.183	-0.076	-4.496	<.001
	Primary hospital	2.052	0.270	0.116	7.593	<.001
	>36 years old	-0.471	0.200	-0.037	-2.356	.019

<sup>a</sup>Determination coefficient  $R^2 = .359$ ; adjusted determination coefficient  $R^2 = .357$ ;  $F = 168.259$ ,  $P < .001$ .

<sup>b</sup>Determination coefficient  $R^2 = .306$ ; adjusted determination coefficient  $R^2 = .304$ ;  $F = 165.104$ ,  $P < .001$ .

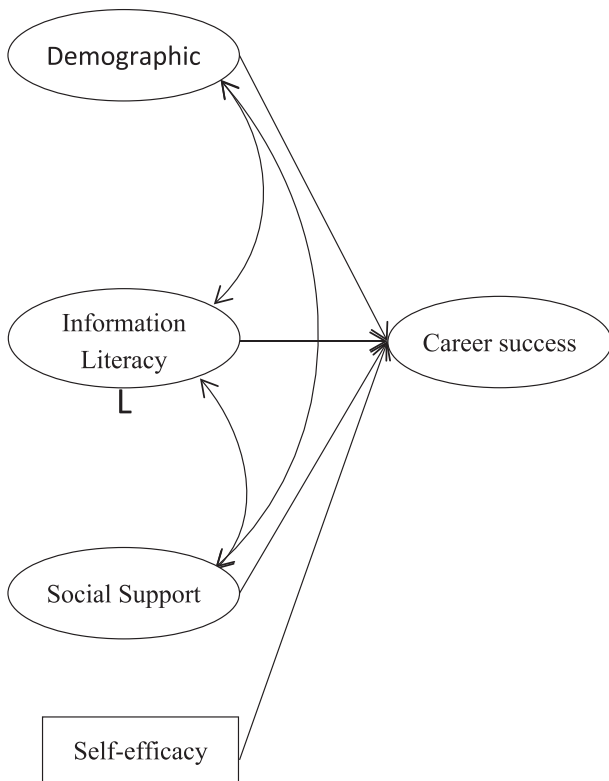
<sup>c</sup>Determination coefficient  $R^2 = .331$ ; adjusted determination coefficient  $R^2 = .328$ ;  $F = 134.678$ ,  $P < .001$ .

Compared with the tertiary hospitals, patients in the lower level hospitals are less seriously ill, and nurses' working environment is less tense, so the level of career success of nurse is higher. The results of our study are consistent with the previous studies, which have shown that work environment is positively correlated with career success of nurses (Wang, Zhang, et al., 2019). Therefore, hospital managers in the tertiary hospitals should attach greater importance to helping nurses achieve career success and offering them support owing to their younger age, lack of work experience and work accumulation, and their sense of achievement is low (Chen et al., 2018).

In Table 4, self-efficacy was influencing factors of nurses' career success, which is consistent with Dan's research results

(Dan et al., 2018b). According to KCM, authenticity is an indispensable factor in career success. Authenticity means facing and accepting oneself. So we used self-efficacy to reflect this parameter. A good sense of self-efficacy is conducive to enhancing individual confidence, which is helpful to address problems actively and facilitate individual success (Karabacak et al., 2019; Santucci et al., 2018). Therefore, it is sensible for nurses to raise awareness of self-efficacy and improve it in their clinical work. They should adopt positive strategies to approach clinical problems. Nursing managers may encourage nurses regularly, so it can help nurses gain confidence in clinical work (Spurlock et al., 2019). In the study of continuing education courses, managers are supposed to develop courses about self-confidence



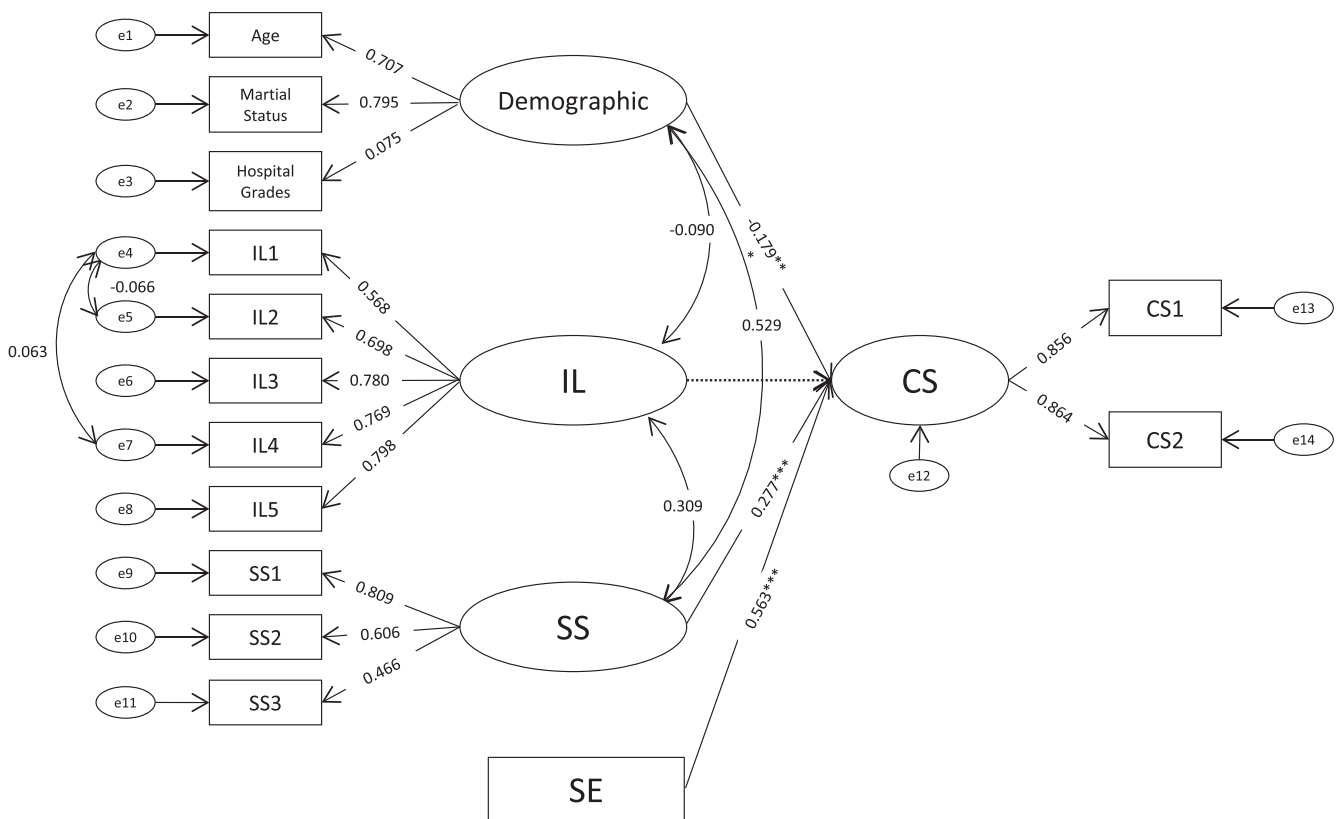


**FIGURE 1** Nurses' career success structural equation model

improvement and collective activities to improve nurses' sense of self-efficacy. Nursing managers may as well carry out clinical skill training for nurses to improve their nursing skills and enhance their self-confidence (McCutcheon et al., 2015).

In KCM, subjective factors and objective conditions are of equal importance to achieve career success. One needs to balance his internal and external relations. Therefore, balance is another important factor in KCM, and we used social support to reflect this parameter. In our study, good social support was another important factor in achieving career success of nurses, and it had a positively predictive effect on career success equation model. Good social support, especially colleague support, is conducive to creating a good working atmosphere and handling difficulties (Li, Guo, et al., 2019; Rogers et al., 2016). Hospital managers are expected to increase the support for clinical nurses by formulating supportive policies, and colleagues are supposed to help and support each other (Gouweloos-Trines et al., 2017). In terms of financial support, nursing managers can increase the bonus in order to stimulate nurses' work enthusiasm. In terms of emotional support, nursing managers need to care about nurses' work and living conditions, providing them with immediate help and emotional support. Additionally, this is a call for family members of the nursing staff to acknowledge the work of nurses and share understanding.

In this study, information literacy was also an important influencing factor of career success. That was consistent with the KCM in which challenges are another important factor for career success. In



**FIGURE 2** Path parameters of model. IL, information literacy; SS, social support; SE, self-efficacy; CS, career success; IL1-IL5, manifest variables of Information Literacy; SS1-SS3, manifest variables of Social support; CS1-CS2, manifest variables of career success; \*\*\* $P < .01$



clinical nursing work, it is a great challenge for nurses to master skills of information identification and processing. So we used information literacy to reflect challenge. However, the effect of information literacy on career success was not significant in SEM. The reason may be that the SEM is used to analyse the relationship between latent variables, whereas multiple linear regression is used to analyse manifest variable (Kiefer & Mayer, 2020). Nurses with good information literacy are more likely to seize the opportunity in big data medical treatment and collect medical data and resources faster and more efficiently (Westra et al., 2017). Therefore, hospital managers tend to highlight the importance of information literacy in nursing work and organize information literacy training to raise nurses' information literacy (Carroll et al., 2019). Besides, managers should improve nurses' information literacy by improving the hospital information system, as well as introducing and popularizing digital medicine (Ricciardi et al., 2019).

## 5 | LIMITATIONS AND RECOMMENDATIONS

There are some limitations in our study that need to be improved through follow-up research. First, our study is conducted in the form of self-report questionnaire, and the results are relatively subjective. Second, our research is only carried out in northwest China, so the regional scope is expected to be further expanded. Last, our study chose the convenient sampling method for the reason that there are too many hospitals in China and the research fund of our study is limited. In future studies, we will choose stratified random sampling method, which may provide a more scientific result, especially in the massive investigation.

## 6 | CONCLUSIONS

Our study evaluated the levels of career success, information literacy, self-efficacy and social support of clinical nurses, explored the relation of the four factors and analysed the influencing factors of career success of clinical nurses. Through the study, we found that information literacy, self-efficacy, social support, hospital grade, age and marital status were the influencing factors of nurses' career success that should be noted by nurses and managers. These findings may be employed as effective measures to enhance nurses' career success.

## 7 | IMPLICATIONS FOR NURSING MANAGEMENT

Hospital and nursing managers should promote the career success of clinical nurses because it is conducive to helping nurses make good career planning, realize the sense of achievements in work, promote the improvement of work efficiency and stabilize the teams of nurses. Hospitals and nursing managers can regularly organize career planning training for clinical nurses to help them clarify the direction of career

development. Additionally, managers should emphasize the importance of information literacy, self-efficacy and social support to the career success of nurses. They can make incentive policies to increase social support for nurses (Fu et al., 2018), promote the training of nurses' information literacy (Phelps et al., 2015) and encourage nurses to increase their self-efficacy (Liu & Aunguroch, 2019).

## ACKNOWLEDGEMENTS

We extend our gratitude to the 30 hospitals and all the nurses involved for their support and cooperation. This study was supported with grants of the Key Research and Development Plan of Shaanxi Province: General Projects - social development field (Grant 2020SF-280).

## CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

## ETHICAL CONSIDERATIONS

Our study was conducted according to the ethical guidelines of the Helsinki Declaration (World Medical Association, 2013). However, an ethics approval was not required according to the institutional guidelines and national laws and regulations because this study was conducted in an anonymous manner and no ethical human trials were involved. We just conducted electronic questionnaire through email and were exempt from further ethics board approval because our study did not involve human clinical trials or animal experiments.

## DATA AVAILABILITY STATEMENT

Authors elect to not share data.

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**How to cite this article:** Wu, C., Zhang, L., Zhang, X., Du, Y., He, S., Yu, L., Chen, H., Shang, L., & Lang, H. (2022). Factors influencing career success of clinical nurses in northwestern China based on Kaleidoscope Career Model: Structural equation model. *Journal of Nursing Management*, 30(2), 428–438. <https://doi.org/10.1111/jonm.13499>