



# Reliability and validity of the Chinese version of the Revised Walsh family resilience questionnaire

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**Background:** Family resilience refers to the ability of a family to overcome life transitions, stress, or adversity. Unfortunately, Chinese nurses currently do not have a valid short-form instrument for determining family resilience. This study aimed to translate the Revised Walsh Family Resilience Questionnaire (WFRQ-R) into Chinese and determine its reliability and validity among stroke survivors and stroke family caregivers.

**Methods:** We translated the WFRQ-R into Chinese according to Brislin's translation guidelines, and conducted a questionnaire survey among stroke survivors and stroke family caregivers., in Jinzhou City, People's Republic of China. We conducted two rounds of the questionnaires. First, we conducted 400 questionnaires, including 394 effective questionnaires for item analysis and exploratory factor analysis. Secondly, we conducted 350 questionnaires, including 322 effective questionnaires for reliability analysis and confirmatory factor analysis.

**Results:** The instrument was found to have a Cronbach's  $\alpha$  value of 0.83 and acceptable composite reliability coefficients. Moreover, content validity was determined to be good, and the three-factor model obtained during exploratory factor analysis (explaining 60.67% of the variance) and modified during confirmatory factor analysis ( $\chi^2/\text{degrees of freedom}=1.41$ ; root mean square error of approximation =0.04; goodness-of-fit index =0.91) suggested an acceptable construct validity.

**Conclusions:** The Chinese version of the WFRQ-R for stroke survivors and stroke family caregivers satisfied psychometric properties and can be used to assess family resilience throughout China.

**Keywords:** Assessment; family resilience; stroke; stroke caregivers

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## Introduction

Family resilience, which is the ability of family members to rebound from life transitions, stress, or adversity, enables family members to cope with a crisis through warmth, support, and cohesion (1). The Walsh Family Resilience (WFR) framework identifies three dimensions for family resilience: family belief system, family organization, and

communication/problem-solving processes. Accordingly, a family belief system involves shared meaning-making efforts, a positive outlook, and transcendence and spirituality; family organization involves flexibility, connectedness, and economic and social resources; and communication/problem-solving processes involve clarity, emotional expression, and collaborative problem solving. Such fundamental processes

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can be expressed through different modalities and measures among families with varied values, resources, and adverse challenges (2). A clinical service framework for healthcare providers has been established from the WFR framework (3).

Stroke is the most common chronic illness in China, with 12.42 million stroke survivors aged  $\geq 40$  years identified in 2018 (4). With the continued aging of society, acceleration of urbanization, unhealthy lifestyle trends, and widespread exposure to cardiovascular risk factors, the burden of stroke for Chinese families has been receiving increasing attention (5). Living with a stroke survivor, who generally exhibits hemiplegia, dysphagia, or depression, places a considerable burden on both the physical and psychological health of family caregivers (6). One study showed that families of middle-aged and elderly individuals with stroke are more likely to experience higher levels of stress, which negatively affects the health and wellbeing of the whole family (7).

Family health workers have recently focused on family resilience research, which has resulted in the family being viewed in a more positive light by healthcare professionals (8). The concept of family resilience has been utilized for various populations over recent years, including those with breast cancers, adolescent cancers, youths with sickle cell disease, children with cleft lip, and children with autism spectrum disorder (9-13). The aforementioned studies indicate that support from family and friends, assistance from professional medical and nursing teams, and community services promote resilience of affected families. Families with higher resilience have been found to exhibit good quality of life, effective control over their treatment or rehabilitation options, increased use of available resources, and maintaining of good social connections (14,15).

Recent studies on family resilience among caregivers caring for individuals with chronic conditions have been encouraging (16,17), but there is a need to establish a tool that measures family resilience among Chinese families facing chronic illnesses.

Among the quantitative measurement tools for assessing family resilience, the Family Resilience Questionnaire (FRQ) (18) has gained wide acceptance on account of the WFR framework. Professor Froma Walsh believes that this measure can be adapted to suit different chronic illnesses by revising the causal questionnaire and translating it into various languages (19). Therefore, Rocchi *et al.* (20) developed an Italian version of the Revised WFRQ (WFRQ-R) in 2017 and, together with eight others, tested its reliability and validity on individuals with different chronic illnesses and their family caregivers. Item analysis

was performed via Rasch analysis, after which five items were deleted, yielding a Cronbach's  $\alpha$  of 0.946. The construct validity of the Italian version of the WFRQ-R was examined using exploratory factor analysis of its structure. The WFRQ-R uses a 5-point Likert-type scale ranging from "strongly disagree" to "strongly agree," with a higher total score indicating stronger family resilience during chronic illness.

To date, little is known about how family caregivers affect stroke survivor outcomes in China, based on the family resilience theory. One possible reason could be the lack of a valid and psychometrically sound measurement tool for assessing family resilience among Chinese stroke survivors and stroke family caregivers. Moreover, a short-version questionnaire would encourage stroke survivors and family caregivers to cooperate compared with two other questionnaires based on Walsh's framework (21,22). The WFRQ-R is suitable tool through which nurses can measure family resilience. Accordingly, the present study aimed to translate the WFRQ-R in order to assess family resilience among Chinese stroke family and evaluate its validity and reliability.

## Methods

### Study design

We used a cross-sectional design that included a three-phase methodology. First, two translations were carried out independently by two experts who taught English and had worked abroad. The translations were compared, and a final combined version was created. Second, the combined Chinese version was translated back into English by a native English translator without reference to the original text. Third, psychologists and nursing experts read the Chinese version, paying particular attention to semantic equivalence, comprehension of terms, concepts, and psychological meaning. Thereafter, some minor changes were made to certain words or expressions to include more commonly used terminology. (e.g., "situation" in item 8 was initially translated into "crisis"). After incorporating all changes, a new backtranslation was provided to the patients and family caregivers.

### Sample

Questionnaire surveys were conducted from February to September of 2019. Participants included stroke

survivors and family caregivers of stroke hospitalized at the Neurology Department of the First Affiliated Hospital of Jinzhou Medical University, China. According to medical investigation and research (23), the sample size should be 5–10-fold larger than the number of items in the instrument used, and should be further expanded by at least 10% to ensure a sufficient sample size. Given that the WFRQ-R has 26 items, a sample size of at least 286 was determined.

Participants who satisfied the following criteria were included: (I)  $\geq 18$  years old, (II) spouse or children of the stroke survivor, (III) ability to read and write, and (IV) voluntarily agreed to participate in the study.

### **Content validity analysis**

One neurology specialist in stroke, one experienced rehabilitation therapist, and three nursing professors were invited to evaluate the content validity of the scale. Each expert determined the relevance of each item to the corresponding dimension based on a 4-point grading scale (4 points = very relevant, 3 points = strong correlation, 2 points = weak correlation, and 1 point = irrelevant). Scale content validity indices (S-CVIs) for the three subscales were then calculated by summing up the item-level content validity indices (I-CVI) and dividing it by the number of items (24).

### **Data analysis**

Descriptive statistics were used to determine the sample characteristics and item distribution. Exploratory factor analysis was performed through principal component analysis with varimax rotation using IBM SPSS Statistics software (version 23.0). Generally, factors with eigenvalues  $>1.0$  were retained (25), while items with factor loadings  $>0.4$  were used to interpret a particular dimension (26). Confirmatory factor analysis was conducted via the maximum likelihood estimation using Amos Graphics software (version 23.0). The three-factor hypothesis model was similar to the original WFRQ-R. The fitness of the proposed  $\chi^2$  model to the data was evaluated using the  $\chi^2$ /degrees of freedom (df) ratio (recommended criteria  $<2.0$ ), comparative fit index (preferably  $>0.90$ ), root mean square error of approximation (RMSEA) ( $<0.05$  was considered a good fit,  $<0.08$  was considered acceptable) (27).

### **Ethical considerations**

All procedures performed in this study involving human

participants were in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the Medical Ethics Committee of the First Affiliated Hospital of Jinzhou Medical University, China (No. 202018). All participants provided informed consent and voluntarily filled out the questionnaires. Participant details were rigorously kept confidential throughout the whole research process.

## **Results**

### **Descriptive statistics of the Chinese version of the WFRQ-R (WFRQ-R-CHI)**

Participants comprised 306 (42.7%) male and 410 (57.3%) female participants. Stroke survivors with an average age of 65.90 ( $\pm 7.43$ ) years. Stroke family members with an average age of 54.31 ( $\pm 3.22$ ) years. Most of the family caregivers were spouses (69.7%), 87.2% of whom had junior high school level education or higher. The Chinese WFRQ-R scores in our sample ranged from 26 to 122, with a mean score of 94.6 [standard deviation (SD) = 0.24], skewness ranging from  $-3.88$  to 1.89, and kurtosis ranging from  $-0.915$  to 12.58.

### **Item analysis of the WFRQ-R-CHI**

Pearson correlation analysis showed a positive correlation between each item and total score, with a correlation coefficient of 0.538–0.857 and a statistically significant difference ( $P < 0.01$ ) (Table 1).

### **Validity of the WFRQ-R-CHI**

#### **Content validity**

The questionnaire had a CVI of 0.93. Moreover, the I-CVIs for 23 items were all higher than 0.78, indicating excellent content validity, although the remaining three items had an I-CVI  $<0.78$  (28). Given that the WFRQ-R-CHI had an acceptable S-CVI (0.93), all 26 items were retained.

#### **Exploratory factor analysis**

The WFRQ-R-CHI had a Kaiser-Meyer-Olkin (KMO) index of 0.91, which exceeded the recommended value of 0.6. Moreover, Bartlett's test for sphericity revealed significant results ( $\chi^2 = 4105.09$ ;  $P < 0.001$ ). These values indicated appropriate exploratory factor analysis results for this sample (29). Principal component analysis revealed

**Table 1** Item-total score correlations (Spearman's rank correlation coefficient) for the Chinese version of the Revised Walsh Family Resilience Questionnaire (n=394).

| Item no. | r     | P value |
|----------|-------|---------|
| 1        | 0.696 | 0.000   |
| 2        | 0.538 | 0.000   |
| 3        | 0.683 | 0.000   |
| 4        | 0.730 | 0.000   |
| 5        | 0.712 | 0.000   |
| 6        | 0.634 | 0.000   |
| 7        | 0.731 | 0.000   |
| 8        | 0.769 | 0.000   |
| 9        | 0.655 | 0.000   |
| 10       | 0.684 | 0.000   |
| 11       | 0.724 | 0.000   |
| 12       | 0.743 | 0.000   |
| 13       | 0.682 | 0.000   |
| 14       | 0.692 | 0.000   |
| 15       | 0.685 | 0.000   |
| 16       | 0.857 | 0.000   |
| 17       | 0.851 | 0.000   |
| 18       | 0.755 | 0.000   |
| 19       | 0.670 | 0.000   |
| 20       | 0.663 | 0.000   |
| 21       | 0.666 | 0.000   |
| 22       | 0.618 | 0.000   |
| 23       | 0.632 | 0.000   |
| 24       | 0.661 | 0.000   |
| 25       | 0.687 | 0.000   |
| 26       | 0.725 | 0.000   |

**Table 2** Exploratory factor analysis of the Chinese version of the Revised Walsh Family Resilience Questionnaire (n=394)

| Item no. | F1    | F2    | F3    |
|----------|-------|-------|-------|
| 2        | 0.740 |       |       |
| 4        | 0.735 |       |       |
| 7        | 0.731 |       |       |
| 5        | 0.710 |       |       |
| 1        | 0.689 |       |       |
| 3        | 0.684 |       |       |
| 9        | 0.659 |       |       |
| 6        | 0.624 |       |       |
| 14       | 0.685 |       |       |
| 15       | 0.682 |       |       |
| 13       | 0.678 |       |       |
| 19       | 0.670 |       |       |
| 20       | 0.669 |       |       |
| 24       | 0.665 |       |       |
| 21       | 0.664 |       |       |
| 8        |       | 0.799 |       |
| 12       |       | 0.746 |       |
| 26       |       | 0.729 |       |
| 11       |       | 0.717 |       |
| 25       |       | 0.690 |       |
| 10       |       | 0.678 |       |
| 23       |       | 0.625 |       |
| 22       |       | 0.589 |       |
| 16       |       |       | 0.856 |
| 17       |       |       | 0.852 |
| 18       |       |       | 0.738 |

F1, factor 1; F2, factor 2, F3; factor 3.

that the three factors accounted for 60.67% of the variance. Each item had acceptable factor loading on each of the 3 factors. The communalities of all items ranged from 0.589 to 0.856 (Table 2).

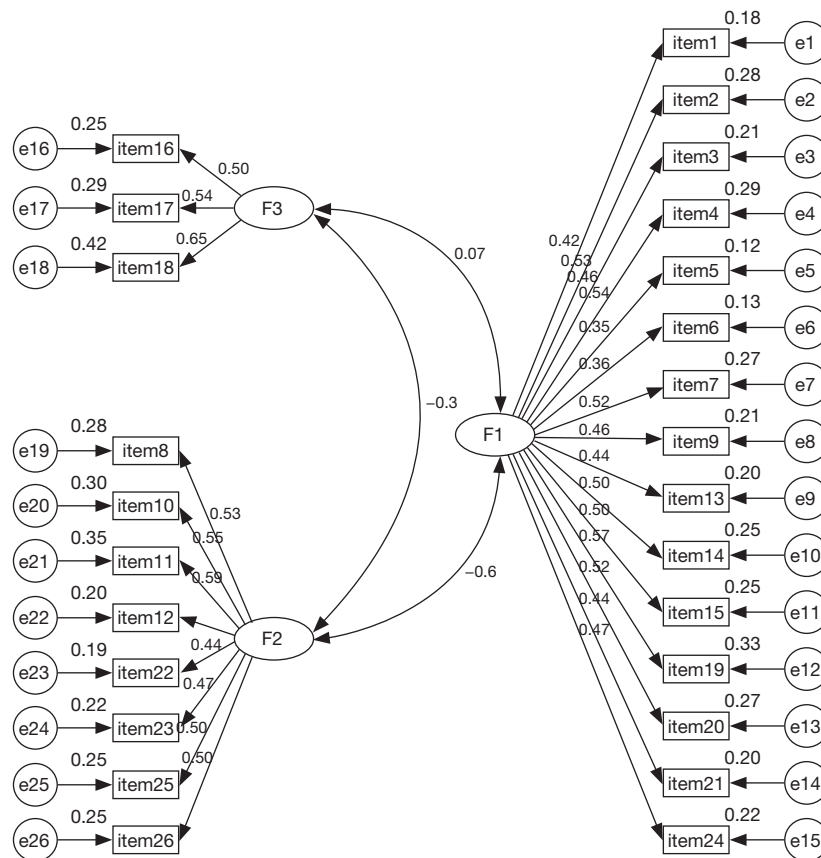
### Confirmatory factor analysis

Initially, confirmatory factor analysis of the three-factor model (n=322) showed unacceptable results. However, after incorporating some changes according to the modification

indices, the new model displayed better and acceptable goodness-of-fit ( $\chi^2/df=1.41$ , RMSEA =0.04; goodness-of-fit index =0.91) (Figure 1).

### Reliability of the WFRQ-R-CHI

A Cronbach's alpha coefficient of 0.83 demonstrated the homogeneity of the WFRQ-R-CHI. And, the Cronbach's alpha coefficient for the three factors of family belief, family organization, and communication/problem-solving



**Figure 1** Confirmatory factor analysis of the modified three-factor model of the Chinese version of the Revised Walsh Family Resilience Questionnaire (n=322).

processes was 0.92, 0.85, 0.79.

## Discussion

The family resilience could be influenced by many factors, and the resilience ability greatly affects the caregiver adjustment of stroke patients. The family resilience is also positively related to the continuous support from the relatives and comorbidities (30). Social support and psycho-education could help to build resilience (31). Objective stressors, appraisals, and caregiver resources are related to the quality of life of caregivers (32). The decrease of life quality of the caregiver could aggravate the burden, anxiety and depression of the caregiver (31). The burden comes from many factors, like clinical symptoms, cultural and lifeworld meanings (33). The imbalance between the burden and coping ability of caregivers make the caregiver frustrated (34). The relationship and MCS score are the two main predictors of burden (35). As for the

caregivers of COPD patients, half of the patients has comorbidities and is taking medicine. About 75% of the caregivers have sought medical help during the course of a year when their caretakers were in charge (35). On facing the burden, the caregivers could feel fatigue and burnout (36). The heavy care burden increases the risk of vulnerability of the caregivers (37). The resilience is a ability to maintain psychological and physical stability and coping the disruptive event positively (38). The role of caregivers induces psychological problems (39). Reducing the burden and/or increase psychological adaptability could help caregivers stay mentally and physically healthy while facing difficulties in caring for patients with stroke. Positive psychology studies character strength, positive relationship and life purpose (40). It could improve the mental health and promote healthy behaviors. Based on the concept of positive psychology, caregivers need to maintain gratitude, mindfulness practices and active activities to promote life goals. These exercises and activities can

enhance self-efficacy, self-control, persistence, immune function, cognitive ability, and neuroplasticity, as well as reduce pain, analgesic use, anxiety, depression, hostility, and stress (41-43).

There have been reported that some methods could assess the resilience in families of patients with a chronic disease. Structured (44) and semi-structured questionnaire (33,45), Walker and Avant's methodology (46), Hospital Anxiety and Depression Scale (HADC), World Health Organization Quality of Life Questionnaire-BREF, Dyadic Coping Inventory (47), SF-36, physical and mental component summary (PCS and MCS), Saint George's respiratory questionnaire (SGRQ) (35) have been reported to assess the resilience. The WFRQ-R has been tested and used in Italy for individuals with chronic illnesses and their relatives. The present study is the first to attempt to translate the WFRQ-R into a simplified Chinese version and thereafter test its reliability and validity among stroke family caregivers in mainland China. Our results suggested that the WFRQ-R-CHI, which does not include complex sentences and can be completed easily within 10-15 min, is a feasible, reliable, and valid tool that can assess family resilience among families dealing with chronic illnesses.

The correlation result of each item of the WFRQ-R-CHI is 0.538–0.857, in which the correlation coefficient of item 2 is less than 0.60, and the consistency of other items is good. After the cultural adjustment of experts and the feedback of the participants, they believe that "family members sharing beliefs and mutual support" is an important reason that affects the resilience of their families. Therefore, item 2 is not deleted, and all items of the questionnaire are retained, which is consistent with the results of the Italian version of the WFRQ-R.

The WFRQ-R-CHI was evaluated and discussed by 7 experts. They agreed that the 26 items of the Chinese version of Walsh family resilience questionnaire can reflect the participants' sharing family beliefs, family interaction, communication patterns and their ability to make use of external resources. It can be used to comprehensively evaluate the family resistance level of stroke family in China. The Content Validity Index of the WFRQ-R-CHI was 0.93, indicating that the content validity of the questionnaire entry is good.

Exploratory factor analysis of the WFRQ-R-CHI, which included three factors, showed that each item had one high load value on one of the three factors. These three factors were the same as that of the Italian version of WFRQ-R established by Rocchi (20). The WFRQ-R-CHI supported the Walsh family resilience theory and could evaluate the

concepts of the Walsh family resilience theory. The results of confirmatory factor analysis showed that the fitness index of the model does not reach the most appropriate standard, but each index is within a reasonable range. It showed that the internal structure of the questionnaire is stable after being tested by stroke survivors and family caregivers.

The psychological distress could be induced by negative coping. Partial mediating effect of positive coping could reduce the psychological distress. The personality, like optimism and hope, could also affect the coping ability. The coping ability could also be promoted by teaching and experience. Social support could also enhance the coping ability (48). Patients with severe chronic diseases, such as stroke-induced disability or mental disorders, and their family members must pace themselves to avoid burnout, rebalance relationships, and establish caregiving cues (49). Further, all family members need to reorganize their needs and resources to survive the crisis and the long-term symptoms that accompany stroke (50).

Nurses may benefit from using the WFRQ-R-CHI to guide their evaluation of family resilience. Using this instrument, nurses may identify specific strengths and necessary resources (51). Family resilience is a dynamic process, given the continuous challenges brought by a chronic disease (52). In addition to chronic diseases, acute diseases, such as COVID-19 infection, are also brought acute threat to the family. The promoted family resilience could be source of healing power of belief and relationship on facing diseases (53).

One limitation of the current study was inclusion of stroke survivors and family caregivers, which did not permit a comparison with the results of the Italian version of the WFRQ-R for families contending with a general chronic disease. Nonetheless, this may be addressed in future studies that consider the role of a specific complication in challenging family resilience skills.

## Conclusions

The present study showed that the WFRQ-R-CHI has sufficient psychometric properties for assessing family resilience among Chinese family caregivers and can be a valid tool through which nurses can observe how families manage their resources over time.

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## Footnote

*Data Sharing Statement:* Available at <https://dx.doi.org/10.21037/apm-21-1152>

*Conflicts of Interest:* Both authors have completed the ICMJE uniform disclosure form (available at <https://dx.doi.org/10.21037/apm-21-1152>). The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are 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. All procedures performed in this study involving human participants were in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the Medical Ethics Committee of the First Affiliated Hospital of Jinzhou Medical University, China (No. 202018). All participants provided informed consent and voluntarily filled out the questionnaires.

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