A Chinese version of the Participation Strategies Self Efficacy Scale (PS-SES): psychometric evaluation in stroke survivors

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ABSTRACT

Objective: To cross-culturally adapt and investigate the psychometric properties of a Chinese-translated version of the Participation Strategies Self Efficacy Scale (PS-SES).

Materials and methods: The translation/back-translation procedure was done in line with cross-cultural adaptation international guidelines. 378 stroke survivors were recruited to complete the questionnaires. The psychometric properties of the PS-SES were evaluated by determining item analysis, internal consistency, test-retest reliability, content validity, construct validity, convergent validity and floor/ceiling effects, respectively.

Results: The intraclass correlation coefficient using the two-way random model (ICC) (test-retest) was 0.923 (95% confidence interval (CI): 0.844–0.962; p < 0.05). Cronbach’s alpha and split-half reliability (internal consistency) for the PS-SES-C was 0.968 and 0.906, respectively. For the content validity, the I-CVI of the PS-SES-C was ranged from 0.860 to 1.000 and the S-CVI was 0.949. In the exploratory factor analysis, a six-factor solution explained 80.695% of the variance. A moderate correlation was found between the PS-SES-C and the Chinese version of WHODAS 2.0 (r = 0.430). A strong correlation was found between the PS-SES-C and the SSEQ-C (0.626).

Conclusion: The PS-SES-C showed satisfactory psychometric properties. It can be considered a reliable and valid instrument to assess the participation strategies self-efficacy of stroke survivors in China.

IMPLICATIONS FOR REHABILITATION

- The Participation Strategies Self Efficacy Scale was translated into Chinese through a rigorous cultural adaptation process.
- PS-SES-C is now a reliable and valid tool for Chinese-speaking patients who have suffered from a stroke.
- It is necessary to assess the participation strategies self-efficacy of stroke survivors in China and develop targeted intervention programs.

Introduction

Stroke is the leading cause of disability worldwide with significant societal cost [1]. According to the Chinese Cardiovascular Report 2018 [2], there are about 13 million individuals who had a stroke in China, of whom 70–80% [3] experience different degrees of dysfunction (such as sensory or motor dysfunctions and cognitive impairment) after discharge. Residual impairments, combined with environmental barriers, can make it difficult for them to pursue participation-related goals such as community participation and work engagement [4].

Participation has become a term used by all health professionals and is considered a critical outcome of successful rehabilitation [5]. Mallinson and Hammel [6] noted that participation is a result of strategizing personal and environmental factors that influence engagement in tasks. Studies have found that stroke survivors who expressed confidence in managing the activities meaningful to them also demonstrated higher satisfaction with life and more active participation [7,8]. Self-efficacy refers to a person’s confidence to perform a particular behavior required to reach a desired goal [9]. Enhancing self-efficacy has become necessary in many chronic diseases [10] because of its influence on health behavior and health status. Self-efficacy is also known to be a significant factor influencing stroke survivors’ participation in self-care and outcomes [11]. Therefore, using appropriate tools to measure self-efficacy in using strategies of people with stroke can be conducive to confirm the role of self-efficacy in leading to better participation outcomes and inform programming of participation focused interventions.

Existing self-efficacy scales, such as the Daily Living Self-Efficacy Scale (DLSES) [12] and Short Self-Efficacy for Exercise (SSEE) [13], have only been used limitedly in the context of participation because they only capture one aspect of participation. Lee et al. [8] developed the Participation Strategies Self Efficacy (PS-SES) as a comprehensive measure assessing self-efficacy in using strategies to manage participation. It is a self-report questionnaire consisting of 35-item divided into six subscales: managing home participation, staying organized, planning and managing community participation, and participating in work activities.

The Participation Strategies Self Efficacy Scale was translated into Chinese through a rigorous cultural adaptation process. PS-SES-C is now a reliable and valid tool for Chinese-speaking patients who have suffered from a stroke. It is necessary to assess the participation strategies self-efficacy of stroke survivors in China and develop targeted intervention programs.
managing work/productivity, managing communication, and advocating for resources. It uses a Likert scale ranging from 1 (not confident at all) to 10 (completely confident). Concerning its good psychometric properties, the ease to assess, and relatively short assessment time, it would be good to use the PS-SES in China to help measure self-efficacy in using strategies for managing participation of stroke survivors in China. There is actually not a properly translated and validated Chinese version yet. Therefore, the aim of this study was to translate the PS-SES in Chinese and examine the psychometric properties of a Chinese version of the PS-SES in order to make this tool available in Chinese clinical settings.

Methods

This study was approved by Ethics Review Committee of life sciences of Zhengzhou University in China (NO. ZZURIB 2019-005). Informed consent was obtained from all study participants.

Translation and cross-cultural adaptation

The PS-SES was translated according to the international recommendations for the cross-cultural adaptation of questionnaires measuring health status [14]. In step I, two bilingual independent translators whose native language is Chinese translated the original English version of the PS-SES into Chinese, respectively (TC-1, TC-2). Then during a meeting between the translators, a synthesized Chinese forward-translated version (TC 1-2) was developed based on TC-1 and TC-2. In step II, the TC 1-2 version was independently translated into English by two new bilingual translators who had never seen the original version. Then two back-translated versions (BT-1 and BT-2) were developed to verify that the Chinese translation was accurate. In step III, a cultural adjustment expert panel consisting of seven bilingual experts in stroke rehabilitation and community nursing was consulted to check for the consistency of meaning between the Chinese version and the original version of PS-SES and to verify the cultural adaptability based on their professional theoretical knowledge and practical experience. Then, a final draft was proofread and corrected and approved by the four translators to ensure the reliability, precision, and comprehensibility. In step IV, 30 stroke patients who met the inclusion and exclusion criteria of this study were recruited for cognitive interviewing and pilot-testing of the final draft. Each participant was asked about their overall understanding of the scale and their understanding of the guidance language and the content of each item of the scale. Based on participant’s feedback, the researcher and seven cultural adjustment experts discussed and revised the final draft of PS-SES to develop the final Chinese version of the PS-SES (PS-SES-C).

Participants

Stroke survivors were recruited from the Lin-shan-zhai Community Health Service Centre, Hang-Hai East Road Community Health Service Centre, and Gao-Xin Zone Science Avenue Community Health Service Centre, and the inpatient rehabilitation ward of the First Affiliated Hospital of Zhengzhou University and the Second Affiliated Hospital of Zhengzhou University. The participants were recruited according to the following inclusion criteria: (1) met the diagnostic criteria of stroke established by the Chinese Medical Association and confirmed by head CT and/or MRI [15]; (2) at least three months post stroke; (3) had no cognitive impairment (Mini-Mental State Examination score ≥ 27) [16]; (4) had a certain degree of dysfunction after stroke (2 ≤ Modified Rankin Scale ≤ 4) [17]; (5) were willing to sign the informed consent form; Stroke survivors were excluded if they were unable to participate in the investigation due to severe acute and critical diseases and infectious diseases, such as severe heart failure, renal failure, liver disease and malignant tumors.

Data collection

Data were collected between August 2019 and June 2020 in several sections. First, the General Information Questionnaire [11] was used to collect demographic and stroke-related information such as gender, age, education level, marital status, primary caregiver, household monthly income, time since stroke, type of stroke, number of times experienced a stroke, main symptoms after stroke, and whether auxiliary devices were used and activities of daily living. This information was collected by asking stroke survivors and/or their primary caregivers or through medical records. Second, the PS-SES-C was administered to all participants by the researchers. Third, participants were asked to complete the Chinese version of the WHODAS 2.0 and the SSEQ-C. The WHODAS 2.0 and SSEQ-C were used to establish convergent validity of the PS-SES-C.

Participants completed the questionnaire at their home, the community healthcare service centers, or the inpatient rehabilitation ward of the hospitals. If a participant was unable to fill in the questionnaire independently, the investigator conducted a verbal interview to collect data. After participants’ completion of the questionnaire, researchers checked its integrity and ensured the accuracy of the data. For the questionnaire with missing items and obvious errors, the investigators would contact the participants by phone for verification. As for the evaluation of test-retest reliability, 30 participants were randomly selected from 378 valid questionnaires and were retested by telephone within two weeks.

Measures

The Chinese version of the World Health Organization’s Disability Assessment Schedule 2.0 (WHODAS 2.0) [18] is a 36-item self-report questionnaire measuring participation in six domains: comprehension and communication (six items), mobility (five items), self-care (four items), getting along (five items), life activities (eight items) and participation (eight items). A lower score indicates better activity and participation. The Cronbach’s α and intraclass correlation coefficient (ICC) in the WHODAS 2.0 was 0.73–0.99 and 0.80–0.89, respectively [18].

The Chinese version of the Stroke Self-efficacy Questionnaire (SSEQ-C) [11] is a self-report questionnaire assessing self-efficacy of Chinese community-dwelling stroke survivors in managing their post-stroke condition. And a higher score indicates better self-efficacy. SSEQ-C consists of 13 items and two subscales: “live with new challenges” and “activity and exercise engagement”. SSEQ-C showed high internal consistency (Cronbach’s α = 0.92) and satisfactory test–retest reliability (ICC = 0.52) [11].

Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics 21 (SPSS) and IBM SPSS AMOS 21.0 (AMOS). Normality of the data was checked using Shapiro–Wilk tests. According to this test, quantitative variables are expressed as the means ± standard deviation (SD), while categorical variables are reported as the absolute and relative frequencies (%). Results were considered statistically significant at the 5% significance level (p < 0.05). In addition,
specific statistical applications were implemented to test the psychometric performance of the PS-SES-C.

**Item analysis**

Item analysis was used to screen and evaluate the quality of items by testing and analysing each item of the PS-SES-C. Pearson correlation analysis and critical ratio (CR) methods were used in this study. For CR, the total scores of valid samples were ranked from high to low. The top 27% were categorized as the high group, and the bottom 27% belonged to the low group [19]. Independent sample t-tests were used to test the difference in scores between high and low group participants. Acceptable values for the item-total correlation and the CR were >0.4 and >3.0, respectively.

**Reliability**

Reliability refers to both the degree of homogeneity in a questionnaire (internal consistency), as well as the reproducibility of the scores (temporal stability or test–retest reliability) [20]. The evaluation of internal consistency was performed using Cronbach’s alpha coefficient and split-half reliability. Split-half reliability treated the two halves of a measure as alternate forms, and the “halves reliability” estimate was then stepped up to the full test length using the Spearman-Brown prediction formula. Cronbach’s alpha values ranging from 0.70 to 0.95 were considered acceptable [21]. The test-retest reliability was evaluated using the Intraclass Correlation Coefficient (ICC), with a 95% confidence interval (CI) [22]. Reproducibility was considered to be “excellent” if intraclass correlation coefficient (ICC, >0.75), “good” (ICC, 0.60–0.74), “fair” (ICC, 0.40–0.59) or “poor” (ICC, <0.40) [23].

**Validity**

Several facets of validity were examined. Content validity was tested through inviting seven experts in related fields by e-mails. The content validity index (CVI) was calculated on both the item-level CVI (I-CVI) and scale-level CVI (S-CVI). An I-CVI of 0.78 and S-CVI of 0.90 were considered good [24]. Construct validity was tested using exploratory factor analysis. Three a priori requirements were set for factor extraction: scree plot point of inflection at the second eigenvalue, eigenvalue cutoff >1.0, and >10% variance. Convergent validity of the PS-SES-C was assessed by determining the bivariate correlations among the total score of the PS-SES-C with the Chinese version of WHODAS 2.0 and the SSEQ-C using Pearson product-moment correlation coefficient for parametric data. Correlation coefficients of 0.10–0.29, 0.30–0.49, and 0.50–1.00 were used as criteria for low, moderate, and strong correlations, respectively [25].

**Feasibility**

The time that participants spent completing the questionnaire was recorded to assess feasibility and acceptability, as well as the percentage of unanswered questions. Ceiling and floor effects were analysed using descriptive statistics and considered to be present if >15% of the respondents achieved the theoretical minimum or maximum possible score of the PS-SES-C. We considered that an effect was present if >75% scored the minimum or maximum possible for each item [26].

**Results**

**Translation and adaptation of the PS-SES**

The translation and back-translation of the scale presented no major difficulty. The translators and expert panel only suggested a few modifications concerning cultural differences and semantic accuracy. For example, “On a scale of 1 to 10, how confident are you that you can …” was translated into “From 1 to 10, how confident do you think you can do the following things …” In addition, the expression “check on” in item 30 was backward-translated misleadingly to “examine.” After experts consultation and a discussion with the original author of the PS-SES, the phrase “… check on you and for you to check on others” in this item was adapted to “you have people around you that call you once in a while/email you/visit you, and you do the same to them.” The result of pilot test demonstrated that participants had difficulty understanding some translations, such as “adaptive equipment” in item 3. After a discussion with translators and experts, the phrase “such as walker aids” was incorporated into item 3 as a supplementary explanation. The translation and adaptation process of the PS-SES is showed in Supplementary Material 1. In addition, the final Chinese version of the PS-SES-C was proofread by five stroke survivors who did not express a need for further revision, and it is presented in Supplementary Material 2.

**Demographic characteristics of the participants**

After excluding 22 unqualified questionnaires, this study conducted data analysis of 378 participants (response rate 94.50%). Their demographic characteristics are shown in Table 1.

**Item analysis**

Item analysis was performed on the PS-SES-C items and six domains, respectively, and the results are shown in Tables 2 and 3. There was a positive correlation between the items and their domain (r > 0.4). The difference between the high and low groups (i.e., CR) was t > 3, which explained the items of the PS-ES-C with a sizeable degree of discrimination.

**Reliability**

Cronbach’s alpha and split-half reliability (internal consistency) of the total score was 0.968 and 0.906, respectively. For each subscale of PS-SES-C, Cronbach’s alpha and split-half reliability ranged 0.894–0.991 and 0.835–0.985, respectively. In addition, when Cronbach’s alpha was analysed for the scale by eliminating each item one at a time, it ranged from 0.967 to 0.969. For test-retest reliability, the ICC was 0.923 (95% CI:0.844–0.962; p < 0.05).

**Validity**

**Content validity**

Seven experts were consulted to examine the consistency of meaning between the Chinese version and the original version of the PS-SES. Each expert made a choice on the relevance of each item to the corresponding dimension, and a 4-point scale rating (1 = not relevant; 2 = somewhat relevant; 3 = quite relevant; 4 = highly relevant) was used to assess each item in the scale. A rating of 3 or 4 was dichotomized as relevant and 1 or 2 as irrelevant. The results of the content validity analysis showed an I-CVI ranged from 0.860 to 1.000 in the PS-SES-C, and the S-CVI was 0.949, indicating good content validity.

**Factor analysis**

The correlation matrix Kaiser-Meyer-Olkin value of the PS-SES-C was 0.903, with a significant Bartlett’s sphericity test (8533.900;
Whether auxiliary devices are used
Yes (e.g., Walking stick; Wheelchair…) 142 (37.6)
No 236 (62.4)

Convergent validity
Correlation coefficients between PS-SES-C and other questionnaires are listed in the Table 5. A moderate and significant negative correlation was found between the Chinese version of WHODAS 2.0 and the PS-SES-C ($r = -0.430$). A strong and significant correlation was found between the SSEQ-C and the PS-SES-C ($r = 0.626$).

Feasibility
The time spent to complete the PS-SES-C by participants in this study was less than ten minutes in all cases. None of the 378 participants received the highest and the lowest total score. 14%, 11%, 2%, 2%, and 2% of participants received the highest score in the managing home participation subscale, planning and managing community participation subscale, managing work/productivity subscale, managing communication subscale, and advocating for resources subscale, respectively, 2% and 26% of participants achieved the lowest score in the staying organized subscale and managing work/productivity subscale, respectively.

Discussion
Stroke posed a great threat to the health of Chinese people [27,28]. Studies have shown that it was urgent to take targeted intervention measures to improve the level of social participation of stroke survivors [29,30]. The use of societal level participation strategies is critical for people with disabilities, given the significant influence on system level barriers on their everyday life [31], and self-efficacy has an important mediating role in managing participation strategies, installing and maintaining health behavior changes and health outcome of stroke survivors, so it is necessary to sinicize the PS-SES for future intervention research.

The PS-SES is the first instrument that measures self-efficacy in using strategies to manage participation in home, work, and community contexts in China. No difficulties were found in the translation process, and results showed that there was no obvious difference between the PS-SES-C and the original PS-SES in terms of conceptual, semantic, operational, and measurement equivalence. The findings of this study show that the PS-SES-C has adequate values in the reliability and validity psychometric indices, similar to those reported in the original study.

The reliability and validity of the scale are related to the quality of every item of the scale [32]. The Pearson correlation coefficient was calculated in this study, and the Pearson $r$ value of each item was greater than 0.4 (ranged 0.703–0.991, $p < 0.05$), which indicated that the items could better represent the theme of the domain. In addition, an independent sample $t$-test between the high- and low-scoring groups showed that the CR of each item was $>3$ ($p < 0.05$) so that no item has been deleted in this process.

Both indices, for internal consistency, were excellent ($>0.9$). Higher than the original version8, the results showed favorable internal consistencies (Cronbach’s alpha range from 0.894 to 0.991) of the scale. This may be due to the larger sample size of this study. The split-half reliability of the PS-SES-C was also satisfactory in this study, indicating that the items of the PS-SES-C are very sensitive to the concepts being evaluated. This study went further to evaluate the test-retest reliability that was not explored in the study of the original version, and the PS-SES-C showed excellent test-retest reliability.

The expert panel’s point of view was considered to assist in the revision. The effectiveness of the consultation was guaranteed by the experts’ authority, mainly involving their familiarity with the consultation content and their judgement. The results of the I-CVI and S-CVI indicated that the PS-SES-C has excellent content
validity. A possible reason for this satisfactory result was that the PS-SES-C basically captured the extent of the self-efficacy in using strategies to manage participation that it was supposed to measure in stroke.

The exploratory factor analysis supported the presence of construct validity, which was consistent with the original version. While item 35 was double loaded, the difference of the two loads was very small, justifying maintaining the original dimensions of the PS-SES-C scale. The attribution of each item was consistent with the original scale, and six factors explained more than 80% of the variance, meeting all three a priori criteria.

Significant correlations were obtained between the PS-SES-C and other instruments that measure participation and self-efficacy, showing the expected convergence, which reinforces the criterion validity. The reported moderate magnitudes of the correlations between the PS-SES-C and the Chinese version of WHODAS 2.0 are due to that participation as a complex concept was influenced by many factors.

A floor effect was detected for the managing work/productivity subscale. This could be because the scale was administered with stroke survivors who had a certain degree of dysfunction after stroke (2 ≤ Modified Rankin Scale ≤ 4). In addition, more than 1/3 of participants had a stroke less than 1 year, and therefore, most of them having no or low confidence in returning to work is understandable and acceptable [33].

Nevertheless, this study has several limitations that must be considered in the interpretation of the results. First, a convenience sample of stroke survivors was included in Zhengzhou, China, and they may not be representative of the whole population. Future studies should confirm these findings in other areas in China to further prove the effectiveness of the PS-SES-C. Second, this study was a cross-sectional study therefore sensitivity to change was not evaluated. Finally, this study did not include stroke survivors with complete independence of daily activities after stroke (0 ≤ Modified Rankin Scale < 2). By including this population, future studies can examine group differences in participation self-efficacy based on required level of assistance or severity of stroke.

### Conclusion

In conclusion, the PS-SES-C is now available in Chinese and the results of the present study demonstrated that it has good

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**Table 2. Item score and correlation coefficient with the domain.**

| Items | Score (mean ± SD) | Correlation coefficient with the domain (r) |
|-------|-------------------|--------------------------------------------|
| Managing Home participation | 42.27 ± 6.67 | 0.833 ** |
| 1. Age in home and prevent nursing home placement | 8.89 ± 1.47 | 0.899 ** |
| 2. Adapt home environment to stay safe and active in it | 8.61 ± 1.49 | 0.934 ** |
| 3. Access and use adaptive equipment (such as walker aids) | 8.80 ± 1.42 | 0.915 ** |
| 4. Adapt home activities to do what you want/need to | 8.15 ± 1.63 | 0.905 ** |
| 5. Access and use resources/information to stay in home and live in the community | 7.82 ± 1.66 | 0.834 ** |

| Questions on Built Environment | 21.23 ± 6.60 | 0.930 ** |
| 6. Organize and keep track of finances and bill payments | 6.79 ± 2.39 | 0.970 ** |
| 7. Use strategies to keep track of appointments or to remember to do things | 7.27 ± 2.22 | 0.956 ** |
| 8. Use strategies to find things easier in your home | 7.17 ± 2.31 | 0.956 ** |
| Planning and managing community participation | 61.27 ± 18.16 | 0.895 ** |
| 9. Create a home workstation to be organized | 6.52 ± 2.404 | 0.895 ** |
| 10. Deal with changes in your health or life | 7.12 ± 1.998 | 0.870 ** |
| 11. Keep participating in activities of choice as you age | 6.79 ± 2.303 | 0.896 ** |
| 12. Feel comfortable with going to places you want to go | 6.79 ± 2.377 | 0.896 ** |
| 13. Plan ahead to do what you want to do in the community | 6.79 ± 2.377 | 0.896 ** |
| 14. Arrange transportation options | 6.69 ± 2.591 | 0.866 ** |
| 15. Strategize falling or fear of falling in the community | 7.19 ± 2.072 | 0.880 ** |
| 16. Strategize fatigue and find ways to save energy | 6.98 ± 2.147 | 0.887 ** |
| 17. Handle issues as they happen in the community | 6.68 ± 2.150 | 0.873 ** |
| Managing work and productivity | 23.79 ± 17.86 | 0.930 ** |
| 18. Identify what you need in order to go back to work/volunteer | 4.51 ± 3.10 | 0.991 ** |
| 19. Identify disability issues when applying for job or volunteer positions | 4.04 ± 3.06 | 0.982 ** |
| 20. Identify essential job functions | 3.93 ± 3.05 | 0.991 ** |
| 21. Identify ways to modify work setting | 3.80 ± 3.02 | 0.992 ** |
| 22. Identify ways to adapt policies | 3.74 ± 3.01 | 0.989 ** |
| 23. Request and negotiate reasonable accommodations | 3.75 ± 3.03 | 0.983 ** |
| Managing communication | 53.45 ± 10.22 | 0.930 ** |
| 24. Ask for help from family/friends without feeling like a burden | 7.12 ± 2.31 | 0.703 ** |
| 25. Speak up for yourself when communicating with family/friends | 8.11 ± 1.52 | 0.857 ** |
| 26. Communicate concerns with family/friends who overprotect you | 8.03 ± 1.50 | 0.783 ** |
| 27. Deal with someone who disrespects you | 7.20 ± 2.05 | 0.788 ** |
| 28. Advocate for yourself so that people do not take advantage of you | 7.71 ± 1.95 | 0.842 ** |
| 29. Feel comfortable communicating with people in public | 7.95 ± 1.71 | 0.815 ** |
| 30. Set up strategies for other people to call you / email you/ visit you once in a while and for you to do the same to them | 7.32 ± 1.94 | 0.757 ** |
| Advocating for resources | 27.88 ± 10.25 | 0.824 ** |
| 31. Access services to help stay in home | 5.22 ± 2.28 | 0.898 ** |
| 32. Strategize long term income support | 5.32 ± 2.36 | 0.898 ** |
| 33. Access services or agencies to help participate in the community | 6.19 ± 2.09 | 0.915 ** |
| 34. Ask for ways to make community accessible to you | 5.54 ± 2.31 | 0.850 ** |
| 35. Find new or alternative job/volunteer opportunities that match your strengths and interest | 5.61 ± 2.53 | 0.895 ** |
| Total scale | 229.88 ± 55.46 | 0.824 ** |

*p < 0.05; **p < 0.01.*
Table 3. Independent sample t test for the high and low scoring groups.

| Items | t Value (CR) | df | p    | Mean difference | Std. Error difference | 95% Confidence interval of the difference |
|-------|--------------|----|------|-----------------|-----------------------|------------------------------------------|
| 1     | 9.173        | 206| <0.01| 1.859           | 0.203                 | 1.460, 2.259                             |
| 2     | 12.284       | 206| <0.01| 2.183           | 0.178                 | 1.833, 2.533                             |
| 3     | 13.058       | 206| <0.01| 2.242           | 0.172                 | 1.903, 2.580                             |
| 4     | 17.093       | 206| <0.01| 2.932           | 0.172                 | 2.593, 3.270                             |
| 5     | 12.830       | 206| <0.01| 2.445           | 0.191                 | 2.069, 2.821                             |
| 6     | 16.638       | 206| <0.01| 4.335           | 0.261                 | 3.822, 4.849                             |
| 7     | 19.447       | 206| <0.01| 4.299           | 0.221                 | 3.863, 4.735                             |
| 8     | 20.044       | 206| <0.01| 4.452           | 0.222                 | 4.014, 4.890                             |
| 9     | 20.535       | 206| <0.01| 4.746           | 0.231                 | 4.290, 5.202                             |
| 10    | 16.671       | 206| <0.01| 3.719           | 0.223                 | 3.280, 4.159                             |
| 11    | 22.374       | 206| <0.01| 5.138           | 0.230                 | 4.686, 5.591                             |
| 12    | 18.606       | 206| <0.01| 4.466           | 0.240                 | 3.993, 4.939                             |
| 13    | 18.435       | 206| <0.01| 4.531           | 0.246                 | 4.046, 5.015                             |
| 14    | 16.944       | 206| <0.01| 4.798           | 0.283                 | 4.239, 5.356                             |
| 15    | 15.719       | 206| <0.01| 3.692           | 0.235                 | 3.229, 4.155                             |
| 16    | 18.150       | 206| <0.01| 4.022           | 0.222                 | 3.586, 4.459                             |
| 17    | 16.907       | 206| <0.01| 3.932           | 0.233                 | 3.473, 4.390                             |
| 18    | 26.916       | 206| <0.01| 6.248           | 0.232                 | 5.791, 6.706                             |
| 19    | 24.951       | 206| <0.01| 6.022           | 0.241                 | 5.546, 6.498                             |
| 20    | 27.652       | 206| <0.01| 6.164           | 0.223                 | 5.725, 6.604                             |
| 21    | 26.236       | 206| <0.01| 6.056           | 0.231                 | 5.601, 6.511                             |
| 22    | 25.577       | 206| <0.01| 5.998           | 0.234                 | 5.535, 6.460                             |
| 23    | 25.057       | 206| <0.01| 6.027           | 0.241                 | 5.553, 6.501                             |
| 24    | 5.429        | 206| <0.01| 1.744           | 0.321                 | 1.111, 2.378                             |
| 25    | 8.418        | 206| <0.01| 1.703           | 0.202                 | 1.304, 2.101                             |
| 26    | 7.564        | 206| <0.01| 1.518           | 0.201                 | 1.123, 1.914                             |
| 27    | 9.003        | 206| <0.01| 2.482           | 0.276                 | 1.939, 3.026                             |
| 28    | 10.408       | 206| <0.01| 2.608           | 0.251                 | 2.114, 3.102                             |
| 29    | 10.189       | 206| <0.01| 2.296           | 0.225                 | 1.852, 2.740                             |
| 30    | 11.601       | 206| <0.01| 2.785           | 0.240                 | 2.311, 3.258                             |
| 31    | 13.755       | 206| <0.01| 3.563           | 0.259                 | 3.052, 4.074                             |
| 32    | 20.163       | 206| <0.01| 4.592           | 0.228                 | 4.143, 5.041                             |
| 33    | 17.076       | 206| <0.01| 4.117           | 0.241                 | 3.641, 4.592                             |
| 34    | 17.530       | 206| <0.01| 3.860           | 0.220                 | 3.426, 4.294                             |
| 35    | 19.576       | 206| <0.01| 4.755           | 0.243                 | 4.276, 5.234                             |
| Total | 38.913       | 206| <0.01| 136.330         | 3.503                 | 129.423, 143.237                        |

CR: Critical ratio; df: Degree of freedom; Std.: Standard.
Table 4. Factor loadings for the six-factor solution in the exploratory factor analysis.

| Items                                                                 | I    | II   | III  | IV   | V    | VI   |
|-----------------------------------------------------------------------|------|------|------|------|------|------|
| 2. Adapt home environment to stay safe and active in it               | 0.820| 0.096| 0.308| 0.100| 0.175| 0.119|
| 1. Age in home and prevent nursing home placement                     | 0.793| 0.167| 0.193| 0.099| 0.280| 0.012|
| 3. Access and use adaptive equipment (such as walker aids)           | 0.792| 0.077| 0.279| 0.185| 0.236| 0.086|
| 4. Adapt home activities to do what you want/need to                 | 0.723| 0.170| 0.385| 0.161| 0.120| 0.291|
| 5. Access and use resources/information to stay in home and live in the community of choice | 0.690| 0.102| 0.343| 0.101| 0.009| 0.310|
| 7. Use strategies to keep track of appointments or to remember to do things | 0.250| 0.695| 0.475| 0.249| 0.111| 0.163|
| 6. Organize and keep track of finances and bill payments              | 0.212| 0.695| 0.409| 0.236| 0.148| 0.259|
| 8. Use strategies to find things easier in your home                 | 0.255| 0.660| 0.504| 0.274| 0.136| 0.178|
| 10. Plan ahead to do what you want to do in the community            | 0.229| 0.015| 0.798| 0.241| 0.170| 0.228|
| 9. Feel comfortable with going to places you want to go              | 0.214| −0.042| 0.794| 0.278| 0.189| 0.242|
| 12. Advocate for yourself so that people do not take advantage of you | 0.217| 0.300| 0.780| 0.189| 0.136| 0.092|
| 15. Strategize falling or fear of falling in the community           | 0.287| 0.290| 0.768| 0.136| 0.126| 0.161|
| 14. Strategize fatigue and find ways to save energy                  | 0.272| 0.034| 0.762| 0.227| 0.264| 0.123|
| 18. Communicate concerns with family/friends who overprotect you     | 0.235| 0.323| 0.741| 0.244| 0.180| 0.148|
| 19. Create a home workstation to be organized                        | 0.157| 0.220| 0.739| 0.272| 0.129| 0.192|
| 22. Communicate concerns with family/friends who overprotect you     | 0.123| 0.094| 0.232| 0.231| 0.093| 0.292|
| 21. Identify ways to modify work setting                             | 0.109| 0.091| 0.227| 0.932| 0.108| 0.173|
| 23. Request and negotiate reasonable accommodations                  | 0.105| 0.086| 0.224| 0.932| 0.102| 0.174|
| 24. Identify disability issues when applying for job or volunteer positions | 0.101| 0.099| 0.232| 0.925| 0.106| 0.178|
| 25. Identify what you need in order to go back to work/volunteer     | 0.127| 0.191| 0.290| 0.829| 0.094| 0.200|
| 26. Communicate concerns with family/friends who overprotect you     | 0.147| −0.014| 0.145| 0.026| 0.855| 0.160|
| 27. Advocate for yourself so that people do not take advantage of you| 0.163| −0.049| 0.180| 0.034| 0.783| 0.096|
| 28. Identify long term income support                                | 0.177| 0.197| 0.184| 0.057| 0.764| 0.191|
| 29. Feel comfortable communicating with people in public             | 0.165| 0.267| 0.085| 0.135| 0.749| 0.145|
| 30. Identify ways to modify work setting                             | 0.109| 0.091| 0.227| 0.932| 0.108| 0.173|
| 31. Communicate concerns with family/friends who overprotect you     | 0.105| 0.086| 0.224| 0.932| 0.102| 0.174|
| 32. Request and negotiate reasonable accommodations                  | 0.107| 0.087| 0.228| 0.930| 0.098| 0.166|
| 33. Identify disability issues when applying for job or volunteer positions | 0.101| 0.099| 0.232| 0.925| 0.106| 0.178|
| 34. Advocate for yourself so that people do not take advantage of you| 0.127| 0.191| 0.290| 0.829| 0.094| 0.200|
| 35. Communicate concerns with family/friends who overprotect you     | 0.147| −0.014| 0.145| 0.026| 0.855| 0.160|
| 36. Communicate concerns with family/friends who overprotect you     | 0.163| −0.049| 0.180| 0.034| 0.783| 0.096|
| 37. Advocate for yourself so that people do not take advantage of you| 0.177| 0.197| 0.184| 0.057| 0.764| 0.191|
| 38. Feel comfortable communicating with people in public             | 0.165| 0.267| 0.085| 0.135| 0.749| 0.145|
| 39. Identify ways to modify work setting                             | 0.109| 0.091| 0.227| 0.932| 0.108| 0.173|
| 40. Communicate concerns with family/friends who overprotect you     | 0.105| 0.086| 0.224| 0.932| 0.102| 0.174|
| 41. Request and negotiate reasonable accommodations                  | 0.107| 0.087| 0.228| 0.930| 0.098| 0.166|
| 42. Identify disability issues when applying for job or volunteer positions | 0.101| 0.099| 0.232| 0.925| 0.106| 0.178|
| 43. Advocate for yourself so that people do not take advantage of you| 0.127| 0.191| 0.290| 0.829| 0.094| 0.200|
| 44. Communicate concerns with family/friends who overprotect you     | 0.147| −0.014| 0.145| 0.026| 0.855| 0.160|
| 45. Communicate concerns with family/friends who overprotect you     | 0.163| −0.049| 0.180| 0.034| 0.783| 0.096|

Boldface represents the items with factor loadings greater than 0.4.

Table 5. Internal validation and convergent validity: correlation coefficient.

The PS-SES-C                          | Managing home participation | Managing home participation | Planning and managing community participation | Managing work/ productivity | Managing communication | Advocating for resources |
---------------------------------------|----------------------------|------------------------------|-----------------------------------------------|----------------------------|------------------------|--------------------------|
The PS-SES-C                           | 0.719                      |                              |                                               |                            |                        |                          |
Managing home participation             | 0.788                      | 0.597                        |                                               |                            |                        |                          |
Planning and managing community participation | 0.891                    | 0.668                        | 0.742                                         |                            |                        |                          |
Managing work/ productivity             | 0.788                      | 0.391                        | 0.522                                         | 0.577                      |                        |                          |
Managing communication                  | 0.637                      | 0.435                        | 0.397                                         | 0.447                      | 0.316                  |                          |
Advocating for resources               | 0.861                      | 0.571                        | 0.626                                         | 0.685                      | 0.601                  | 0.633                    |
The WHODAS 2.0.                         | −0.430                     | −0.446                       | −0.386                                        | −0.463                     | −0.210                 | −0.273                   |
The SSEQ-C                              | 0.626                      | 0.534                        | 0.579                                         | 0.647                      | 0.356                  | 0.366                    |

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