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# **Validation study of a Chinese version of Partners in Health in Hong Kong (C-PIH HK)**

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## Compliance with Ethical Standards

Conflict of interest: The authors declare that they have no conflict of interest.

Keywords: self-management, chronic condition, Chinese, scale validation, cultural adaptation

## **Validation study of a Chinese version of Partners in Health in Hong Kong (C-PIH HK)**

### Abstract

**Background:** The Partners in Health (PIH) scale is a measure designed to assess the generic knowledge, attitudes, behaviours and impacts of self-management. A cross-cultural adaptation of the PIH for use in Hong Kong was evaluated in this study. This paper reports the validity and reliability of the Chinese version of PIH (C-PIH[HK]).

**Method:** A 12-item PIH was translated using forward-backward translation technique and reviewed by individuals with chronic diseases and health professionals. A total of 209 individuals with chronic diseases completed the scale. The construct validity, internal consistency and test-retest reliability were evaluated in two waves.

**Results:** The findings in Wave 1 ( $n = 73$ ) provided acceptable psychometric properties of the C-PIH(HK) but supported the adaptation of question 5 to improve the cultural relevance, validity and reliability of the scale. An adapted version of C-PIH(HK) was evaluated in Wave 2. The findings in Wave 2 ( $n = 136$ ) demonstrated good construct validity and internal consistency of C-PIH(HK). A principal component analysis with Oblimin rotation yielded a 3-factor solution, and the Cronbach's alphas of the subscales ranged from 0.773 to 0.845. Participants were asked whether they perceived the self-management workshops they attended and education provided by health professionals as useful or not. The results showed that the C-PIH(HK) was able to discriminate those who agreed and those who disagree related to the usefulness of individual health education ( $p < .0001$  in all subscales) and workshops ( $p < .001$  in the Knowledge subscale) as hypothesized. The test-retest reliability was high (ICC = 0.818).

**Conclusion:** A culturally adapted version of PIH for use in Hong Kong was evaluated. The study supported good construct validity, discriminate validity, internal consistency, and test-retest reliability of the C-PIH(HK).

## **Introduction**

The Flinders Program™ of Chronic Condition Self-Management (CCSM) (Flinders Program) has been developed based on 15 years of research and clinical application [1, 2]. The results suggested that interventions should support individuals to actively participate in chronic disease management. The Flinders Program is made up of several tools and begins with the Partners in Health (PIH) scale [3], a generic self-rated assessment of self-management. The PIH scale was designed to measure the knowledge, attitudes, behaviours, and impacts of CCSM. The scale can be used in a range of chronic conditions and to measure changes over time. The original version was an 11-item questionnaire on a 0-8 Likert rating scale. Factor analysis supported a 3-factor solution (Cronbach's alpha = 0.88) [3]. Later, two 12-item versions were developed (version A and version B<sup>1</sup>) [4, 5] and demonstrated good construct validity and internal consistency in the English, Spanish, and Dutch versions (Cronbach's alphas ranged from 0.66 to 0.82) [4, 6, 7]. The PIH has been used to validate the Multiple Sclerosis Self-Management Scale [8]. The results supported moderate to high correlation of the PIH with the disease-specific self-management scale. In studies of common chronic conditions, the PIH was associated with self-efficacy [9, 10] and health literacy [7]. The 12-item PIH (version B) was the latest version. All items of the 12-item PIH (version B) are answered on a 9-point Likert scale and rated on a "0" (very little, never, or not very well) to "8" (a lot, always or very well) scale. The total score range is 0-96, where higher scores indicate better self-management. This study used the 12-item PIH (version B).

When the Flinders Program™ was introduced to Hong Kong, a Chinese version of the PIH (C-PIH[HK]) was needed to be developed in order to integrate the use of PIH in the care planning process among Chinese speaking people in Hong Kong. In this study, a cross-cultural adaptation of the PIH for use in Hong Kong was evaluated. The paper reports the development, validity and reliability of the C-PIH(HK) scale.

## **Methods**

### Forward-Backward Translation

Two bilingual professionals who were familiar with the CCSM concepts translated the PIH into Chinese. Using back translation technique [11], the items were translated back into English by two bilingual translators who had not reviewed the PIH before. Inconsistencies identified were analysed. Revisions were made to improve the wordings.

### Cultural adaptation and expert review

Sixteen individuals with chronic diseases reviewed the cultural relevance of C-PIH(HK) in two focus groups. They aged 50- 59 years, with 81.3% females and 81.3% had received self-management education. In addition, nine healthcare professionals rated the clarity and clinical utility of C-PIH(HK). They included healthcare professionals in medicine, nursing, physiotherapy, occupational therapy and social work.

### Validity and reliability

A total of 209 participants were recruited from three settings: the Haven of Hope Hospital, the Hong Kong Society for Rehabilitation and a local church. There were two waves of recruitment. Wave 1 evaluated the cultural relevance of the items (n = 73) and Wave 2 evaluated the psychometric properties of the final version of the C-PIH(HK) (n = 136). Table 1 presents their characteristics.

Construct validity of the C-PIH(HK) was evaluated. Principle component analysis with Oblimin rotation was conducted. It was hypothesized that the C-PIH(HK) would be moderately correlated with the Health Education Impact Questionnaire (heiQ) [12]<sup>2</sup>. The 40-item heiQ is a questionnaire designed to evaluate patient education programs across a broad range of chronic conditions. The heiQ has good validity

and reliability for the measurement of chronic disease self-management. The ability of the C-PIH(HK) to discriminate self-management capacity was assessed by comparing known groups of participants who had received self-management education with those who had not.

The internal consistency was calculated using the Cronbach's alpha coefficient. Test-retest reliability was evaluated by inviting 21 participants in Wave 1 and 19 participants in Wave 2 to repeat the C-PIH(HK) after 2 weeks.

Ethics approvals were obtained from the Hong Kong Polytechnic University and Hong Kong Hospital Authority. All statistical analyses were conducted using the IBM SPSS Statistics 20 [13].

## **Results**

### Cultural relevance and clinical relevance

The focus group members found the rating scale easy to use. They had no difficulties understanding most items except the cultural relevance of question 5. Most of the professional participants indicated that the C-PIH(HK) helped them to understand the patients' attitude, knowledge and behavior in self-management. They commented on the wordings of some questions. The findings were used to revise the scale.

### Factor analysis, validity and reliability in Wave 1

The principal component analysis with Oblimin rotation yielded a 4-factor solution and explained 53.1% of the total variance. All items had a factor loading greater than 0.35. However, the response pattern of question 5 was highly skewed, with 60.3% of the participants rated "0" on a 0-8 rating scale. When the principal component analysis was repeated without question 5, there was an increase of the variance explained to 55.1%. Question 5 was excluded in further analysis of Wave 1. Two hypotheses of the construct validity were supported. First, moderate correlations were found between the subscales of C-PIH(HK) and the subscales of heiQ. The knowledge subscale correlated with 7 heiQ subscales ( $r = -0.25$  to  $0.53$ ,  $p < 0.05$ ). The coping subscale correlated with 7 heiQ subscales ( $r = -0.31$  to  $0.47$ ,  $p < 0.05$ ). The adherence/management subscale correlated with 3 heiQ subscales ( $r = 0.29$  to  $0.36$ ,  $p < 0.05$ ). Second, participants who had received self-management education had higher C-PIH(HK) subscale scores than those who had not in terms of individual education given by health professionals ( $t$  test,  $p = <0.05$  in the knowledge subscale) and CCSM courses ( $t$  test,  $p < 0.05$  in all subscales). The test-retest intraclass correlation coefficient (ICCrandom) was 0.913. The mean test-retest interval was 14.2 days (SD = 5.4).

The findings showed that cultural adaptation of question 5 would be needed in order to improve the psychometric properties of the C-PIH(HK). The main concept of question 5 was "I am able to deal with health professionals to get the services I need...", which is relevant to the healthcare context in Hong Kong. The less relevant concept was the second part of the question: "...that fit with my culture, values and beliefs." Question 5 was improved by removing the second part and keeping only the main concept. A second wave of participants was recruited, and the analysis was repeated using the final version ("Appendix").

### Factor analysis, validity and reliability in Wave 2

The principal component analysis with Oblimin rotation yielded a 3-factor solution and explained 67.8% of the total variance (Table 2). The 3 factors formed the knowledge, coping, and adherence and symptom management subscales. The Cronbach's alphas of the knowledge, coping, and adherence/management subscales were 0.773, 0.922, and 0.845 respectively.

The findings supported the ability of the C-PIH(HK) to discriminate known-groups. The C-PIH(HK) subscale scores were higher among participants who rated the education as useful (useful group) than those who rated the education as not useful or had not received the education (comparison group). The

differences were statistically significant in two education formats: individual education ( $p < 0.001$  in all subscales) and CCSM courses ( $p < 0.01$  in knowledge subscale). The knowledge, coping and adherence/management subscale scores were 5.06, 5.38, and 6.18 respectively.

The test-retest reliability was high. The  $ICC_{\text{random}}$  was 0.818. The mean test-retest interval was 19.2 days (SD = 4.0).

## **Discussion**

In this study, a cultural adaptation of the PIH for use in Hong Kong was evaluated. Most items were relevant to the healthcare context in Hong Kong except the second part of question 5. The main concept of Question 5 was “I am able to deal with health professionals to get the services I need.” The second part was “...that fit with my culture, values and beliefs”. Focus group participants said that they understood the second part as visiting museums, attending festival events, going to theatres and so on. Obviously, their understanding would be irrelevant to the main concept of question 5. After the focus groups, the research team attempted to keep the second part by improving the translation. The improved version was tested in Wave 1 study. Wave 1 results found that 60% of the participants rated “0,” and the reliability improved after removal of question 5. Apparently, people in Hong Kong and perhaps the healthcare system as well seldom consider cultural backgrounds and health beliefs pertaining to an individual’s health service needs. The team decided to remove the second part of question 5. The revised version was tested in Wave 2 study, and the results showed an improvement in the reliability and validity of the scale.

The C-PIH(HK) had a slightly different factor structure when compared to the Petkov’s study [4]. Four factors were identified in the Petkov’s study, and three factors were identified in the C-PIH(HK) study. Common to both studies were the “knowledge” and “coping” factors. The Petkov’s study found that “adherence” and “symptom management” loaded on two separate factors. However, the items in these two factors loaded in one factor in the C-PIH(HK) study. A possible explanation of the difference was that the two studies used different versions of the PIH. The Petkov’s study used version A and the current study used version B. Two symptoms management items in Version A were removed. Two new items, emotional coping and service access, were added in Version B. When the C-PIH(HK) was compared to a Spanish version [6] and a Dutch version [7], the C-PIH(HK) and the Spanish version yielded a 3-factor solution while the Dutch version returned a 4-factor solution. Possible reasons could be differences in prior self-management education of the participants, comorbidity and complexity of chronic diseases, healthcare systems, and primary care services, or all of the above.

The original PIH has been designed to assess self-management needs, measure changes over time and evaluate service effectiveness. In this study, a culturally adapted version for use in Hong Kong was evaluated. The study supported good construct validity, discriminate validity, internal consistency, and test-retest reliability of C-PIH(HK).

## References

1. Battersby, M., Harvey, P., Mills, P. D., Kalucy, E., Pols, R. G., Frith, P. A., McDonald, P., Esterman, A., Tsourtos, G., Donato, R., Pearce, R., & McGowan, C. (2007). SA HealthPlus: a controlled trial of a statewide application of a generic model of chronic illness care. *Milbank Q*, 85(1), 37-67.
2. Lawn, S., & Schoo, A. (2010). Supporting self-management of chronic health conditions: common approaches. *Patient Educ Couns*, 80(2), 205-211.
3. Battersby, M., Ask, A., Reece, M., Markwick, M., & Collins, J. (2003). The partners in health scale: the development and psychometric properties of a generic assessment scale for chronic condition self-management. *Aust J Prim Health*, 9, 41-52.
4. Petkov, J., Harvey, P., & Battersby, M. (2010). The internal consistency and construct validity of the partners in health scale: validation of a patient rated chronic condition self-management measure. *Qual Life Res*, 19(7), 1079-1085.
5. Harvey, P. W., Petkov, J. N., Misan, G., Fuller, J., Battersby, M. W., Cayetano, T. N., Warren, K., & Holmes, P. (2008). Self-management support and training for patients with chronic and complex conditions improves health-related behaviour and health outcomes. *Aust Health Rev*, 32(2), 330-338.
6. Peñarrieta-deCórdova, I., FlorabelBarrios, F., Gutierrez-Gomes, T., Piñonez-Martinez, M. S., Quintero-Valle, L. M., & Castañeda-Hidalgo, H. (2014). Self-management in chronic conditions: partners in health scale instrument validation. *Nursing Management*, 20(10), 32-37.
7. Heijmans, M., Waverijn, G., Rademakers, J., van der Vaart, R., & Rijken, M. (2015). Functional, communicative and critical health literacy of chronic disease patients and their importance for self-management. *Patient Educ Couns*, 98(1), 41-48.
8. Ghahari, S., Khoshbin, L. S., & Forwell, S. J. (2014). The multiple sclerosis self-management scale: clinicometric testing. *Int J MS Care*, 16(2), 61-67.
9. Gallagher, R. (2010). Self management, symptom monitoring and associated factors in people with heart failure living in the community. *Eur J Cardiovasc Nurs*, 9(3), 153-160.
10. Gallagher, R., Donoghue, J., Chenoweth, L., & Stein-Parbury, J. (2008). Self-management in older patients with chronic illness. *Int J Nurs Pract*, 14(5), 373-382.
11. Brislin, R. W. (1970). Back-Translation for Cross-Cultural Research. *Journal Of Cross cultural Psychology*, vol, 1(3), 185-216.
12. Osborne, R. H., Elsworth, G. R., & Whitfield, K. (2007). The Health Education Impact Questionnaire (heiQ): An outcomes and evaluation measure for patient education and self-management interventions for people with chronic conditions. *Patient Education and Counseling*, 66(2), 192-201.
13. IBM. (2012). IBM SPSS Statistics 20 (Version 20).

Table 1 Characteristics of Phase II participants (N=209)

Characteristics	Wave 1 (n=73)		Wave 2 (n=136)	
	Frequency	%	Frequency	%
Age (years)				
Mean (SD)	55.9 (11.4)		56.6 (11.6)	
Gender				
Male	29	39.7	54	41.9
Female	44	60.3	75	58.1
Education				
Primary	14	19.2	33	25.6
Secondary	50	68.5	69	53.5
Tertiary or above	9	12.3	26	20.9
No. of chronic disease(s)				
1	30	41.1	49	38.0
2	25	34.2	47	36.4
3 or more	18	24.7	33	25.6
Types of chronic disease				
Hypertension	34	46.6	60	44.1
Diabetes	32	43.8	54	39.7
Respiratory Disease	13	17.8	8	5.9
Heart Disease	12	16.4	10	7.4
Other	39	53.4	0	0
Attended CDSM workshops				
Yes	50	68.5	66	66.2
Never	19	26.0	39	28.7
Received education from healthcare professionals				
Yes	44	60.3	90	66.2
Never	27	37.0	39	28.7



Table 2 Principle component analysis with Oblimin rotation of C-PIH HK in Wave 2

Items	Coping	Symptom management and adherence	Knowledge
Q1			0.910
Q2			0.748
Q3		0.866	
Q4		0.468	
Q5			0.418
Q6		0.717	
Q7		0.752	
Q8		0.587	0.443
Q9	0.805		
Q10	0.890		
Q11	0.895		
Q12	0.845		

Factor loadings less than 0.4 were suppressed in this table

## Appendix

See Table 3.

Table 3 Chinese Partners in Health (Hong Kong version)---C-PIH(HK)

No	Chinese version of C-PIH HK	English translation of the C-PIH HK
1	整體上,我對自己的健康狀況的了解程度是	Overall, what I know about my health condition(s) is
2	整體上,對改善我健康狀況的治療方法,我了解程度是(包括所使用的藥物)	Overall, what I know about the treatment, including medications of my health condition(s) is
3	我依從醫生或醫護人員的指示,使用藥物或進行治療	I take medications or carry out the treatments asked by my doctor/health worker
4	我與醫生或醫護人員按我的健康狀況,一同決定治療方法	I share in decisions made about my health condition(s) with my doctor or health worker
5	我能夠主動要求醫生或醫護人員配合我的服務需要	I am able to deal with health professionals to get the services I need
6	我依從醫生或醫護人員的指示覆診	I attend appointments as asked by my doctor or health worker
7	我有監察自己的症狀和一些異常警告信號(例如:血糖指數,血壓,體重,氣喘,疼痛,睡眠狀況,情緒等)	I keep track of my symptoms and early warning signs (e.g. blood sugar levels, peak flow, weight, shortness of breath, pain, sleep problems, mood)
8	當我身體有異常警告信號和症狀轉差時,我有作出處理	I take action when my early warning signs and symptoms get worse
9	我的活動能力(即是步行,做家務等)因健康狀況受到影響時,我處理得	I manage the effect of my health condition(s) on my physical activity (i.e. walking, household tasks)
10	我的心情(即是情緒,心靈健康等)因健康狀況受到影響時,我處理得	I manage the effect of my health condition(s) on how I feel (i.e. my emotions and spiritual wellbeing)
11	我的社交生活(即是與他人相處)因健康狀況受到影響時,我處理得	I manage the effect of my health condition(s) on my social life (i.e. how I mix with other people)
12	對於過健康生活(例如:不吸煙,不醉酒,健康飲食,恆常運動,管理壓力等),整體上我的處理能力是	Overall, I manage to live a healthy life (e.g. no smoking, moderate alcohol, healthy food, regular physical activity, manage stress)

Rated on a 9-point scale, 0-8 with the following descriptors of the scores: a) “very little”, “something”, to “a lot” in Q1 and Q2; b) “never”, “sometimes”, to “always” in Q3, Q4, Q5, Q6, Q7, and Q8; c) “not very well,” “fairly well,” to “very well” in Q9, Q10, Q11 and Q12. Higher scores indicate better self-management.