Chula Med J Vol. 61 No. 2 March - April 2017

Patient-rated Wrist/Hand Evaluation: A cross-cultural adaptation and evaluation in Thai version

Hathaya Jongprasitkul* Titrison Sonthimaneerat**
Sarawut Somana** Wasuwat Kitisomprayoonkul*

Jongprasitkul H, Sonthimaneerat T, Somana S, Kitisomprayoonkul W. Patient-rated Wrist/Hand Evaluation: A cross-cultural adaptation and evaluation in Thai version. Chula Med J 2017 Mar-Apr;61(2): 183 - 92

Background : *The Patient Rated Wrist/Hand Evaluation (PRW/HE) is a specific questionnaire designed to measure wrist/hand pain and disabilities. The questionnaire was validated to provide various scales by asking questions regarding wrist-hand injury of a patient. It has also been translated into several languages. Therefore, we translated and adapted the questionnaire into Thai version for hand therapy clinic.*

Objectives : *To translate and to cross-culturally adapt the PRW/HE into Thai (PRW/HE-Thai) and to evaluate it's the reliability and validity.*

Methods : *The original version PRW/HE was translated with cross cultural adaptation into Thai (PRW/HE-Thai). A total of 148 outpatients from Occupational therapy (OT) hand therapy clinic were included in the study. They completed questionnaire, PRW/HE-Thai, The Disabilities of the Arm, Shoulder and Hand (DASH-Thai) at first visit and the PRW/HE-Thai again 14 days later. Reliability was measured by determining test - retest reliability (intraclass correlation coefficient) and internal consistency (Cronbach's alpha coefficient). Validity was performed using Pearson's correlation test.*

* Department of Rehabilitation Medicine, Faculty of Medicine, Chulalongkorn University

** Department of Rehabilitation Medicine, King Chulalongkorn Memorial Hospital, the Thai Red Cross Society, Thailand

Result : *Cronbach's alpha coefficient and intraclass correlation coefficient (ICC) for the test-retest reliability of PRW/HE-Thai were 0.94 and 0.89, respectively. The correlation coefficient between PRW/HE- Thai and DASH-Thai scores was 0.76.*

Conclusion : *Thai-version of the PRW/HE is a short and easily understood self-administered questionnaire. Our results show that PRW/HE-Thai is a practical, reliable and valid instrument and can be recommended to measure patient-rated pain and disability in Thai patients. In the future, the questionnaire should also be compared to objective measurement.*

Keywords : *Occupational therapy, PRW/HE-Thai, questionnaire, OT hand therapy, cross-cultural adaptation.*

Correspondence to : Jongprasitkul H. Department of Rehabilitation Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.

Received for publication. April 27, 2016.

หัทยา จงประสิทธิ์กุล, ธิติสรรค์ สันติมณีรัตน์, ศราวุธ สมนา, วสุวัฒน์ กิติสมประยูรกุล. แบบประเมินการใช้งานของมือและข้อมือด้วยตนเองฉบับภาษาไทย. จุฬาลงกรณ์เวชสาร 2560 มี.ค. – เม.ย.;61(2): 183 – 92

เหตุผลของการวิจัย : *การประเมินผลเป็นกระบวนการสำคัญที่ทำให้ทราบอาการ ระดับการทำงาน ความพิการ การเปลี่ยนแปลงและประสิทธิผลของการให้การบำบัดในผู้ป่วยที่มีการบาดเจ็บหรือผิดปกติของแขน มือ/ข้อมือ คณะผู้วิจัยจึงนำแบบประเมินระดับการทำงานของมือ/ข้อมือ (PRW/HE) ซึ่งนิยมใช้ในการวัดระดับความปวดและการใช้งานของมือ ทั้งได้รับการทดสอบแล้วว่ามีมาตรฐานสูง นิยมใช้อย่างแพร่หลายในต่างประเทศ โดยนำมาดัดแปลงเป็นฉบับภาษาไทยปรับประยุกต์และทำการทดสอบความถูกต้องเที่ยงตรงอย่างรัดกุมเพื่อความมีมาตรฐานให้เท่าเทียมกับต้นฉบับ*

วัตถุประสงค์ : *ดัดแปลงแบบสอบถาม PRW/HE เป็นภาษาไทยและปรับปรุงให้สอดคล้องกับบริบทของคนไทยและวิเคราะห์ความเที่ยงตรงและความน่าเชื่อถือ*

ตัวอย่างและวิธีการศึกษา : *ผู้ป่วยจำนวน 148 คน ที่เข้ารับการบำบัดฟื้นฟูมือหน่วยกิจกรรมบำบัด ฝ่ายเวชศาสตร์ฟื้นฟู โรงพยาบาลจุฬาลงกรณ์ ผู้ป่วยเข้ารับการตอบแบบสอบถาม PRW/HE-Thai และ DASH-Thai ครั้งแรก หลังจากนั้น 14 วัน ผู้ป่วยตอบแบบสอบถาม PRW/HE-Thai อีกครั้ง วิเคราะห์หาความน่าเชื่อถือด้วยค่าสัมประสิทธิ์ความสม่ำเสมอภายใน (internal consistency) ด้วยค่าสัมประสิทธิ์อัลฟาของครอนบัคและ Intraclass correlation coefficient (ICC) ด้วยวิธีการทดสอบซ้ำ (Test-retest reliability) ความเที่ยงตรงโดยการวิเคราะห์ Pearson Correlation coefficient โดยนำไปเปรียบเทียบกับ DASH-Thai ที่เวลาเดียวกัน*

ผลการศึกษา : *ผลการวิเคราะห์ความน่าเชื่อถือในการวัดซ้ำ (Test-retest reliability) ของ PRW/HE-Thai ทั้งฉบับแสดงโดย Intraclass correlation coefficient (ICC) พบว่ามีความน่าเชื่อถือในระดับสูง (ICC = 0.89) การทดสอบความน่าเชื่อถือภายใน (Internal consistency reliability) มีความน่าเชื่อถือสูง (Cronbach's alpha = 0.94) และเมื่อนำคะแนนรวมของ PRW/HE (Thai version) ครั้งที่ 1 ไปเปรียบเทียบกับ DASH-Thai พบว่ามีค่าสัมประสิทธิ์ความเที่ยงตรงสูงเช่นกัน (r = 0.76, P <0.01)*

สรุป : *แบบประเมินระดับการทำงานของมือ/ข้อมือ ฉบับภาษาไทยมีความเที่ยงตรงและเชื่อถือได้ที่จะนำมาใช้ในผู้ป่วยชาวไทยที่มีความผิดปกติของการใช้งานของมือ/ข้อมือได้*

คำสำคัญ : *กิจกรรมบำบัด, แบบสอบถามการทำงานมือ/ข้อมือฉบับภาษาไทย, การบำบัดโรคทางมือ.*

Occupational therapy focuses on treatment to patients with injuries or disorders of the upper extremities, which has an important role in the rehabilitation such as reducing pain, edema, regain motion, muscle strength and dexterity. Therefore, patients can restore their hand function and ability to perform activities of daily living.[1 - 4] Hand and wrist problems are commonly found in a hand therapy clinic which is caused by injuries or the natural process of aging. An outcome assessment is becoming important in evaluating for dysfunctions. Nowadays, evaluating physical performance in hand therapy composes of measuring grip strength, range of motion, and sensation which provides a good objective analysis of the outcomes.[5, 6] However, these methods do not take into account other aspects related to an analysis of outcome, such as the patient's ability to carry out of activities of daily living, the ability to return to previous occupations and pain.[7] Patients' self-report measures are an integral component of describing the outcome of hand therapy,[8] an outcome tool for routine use has been selected via systematic process in hand therapy clinic. According to a literature review of available instruments, the choice had been determined into two instruments: disability of the arm, shoulder and hand (DASH) and Patient Rated Wrist/ Hand Evaluation (PRW/HE).[8] The DASH score is the best instrument for evaluating patients with disorders involving multiple joints of the upper limb including shoulder, elbow, wrist and hand. [5, 9] It has been translated and implemented in the Thai language (DASH-Thai). [10] On the other hand, the Patient Rated Wrist Evaluation (PRWE) was firstly used by MacDermid JC, *et al*. [11] The PRWE questionnaire has been modified subsequently to allow clinicians to assess, not only the wrist, but also the hand conditions. In this case, its name has been changed to patient-rated wrist/hand evaluation (PRW/HE) questionnaire , [12] it was recommended that PRW/HE be preferred to DASH when assessing wrist/hand function[8] and has been translated into several languages including Chinese, Japanese, Hindi, Korean, German, Swedish, and, Italian. [13 - 18] Thus, PRW/HE showed the questionnaire of our choice for cross-cultural adaptation into Thai-version. A process of cross-cultural adaptation should be firstly concerned when a self-evaluated questionnaire is going to be applied in different languages and we considered that Thai version of PRW/HE will simply provide an opportunity to communicate more effectively with Thai patients with wrist/hand problems.

This study aims to translate and cross-culturally adapt PRW/HE in to Thai (PRW/HE-Thai) and also to evaluate its reliability and validity.

Materials and Methods

The permission for translation and validation of the questionnaires were achieved by MacDermid JC. The PRW/HE questionnaire is a 15-item questionnaire which is divided into pain sub- score and function sub- score. The pain sub-score contains five items rated as: 0 =no pain; and 10 = the worst pain. The pain score is equal to the sum of the five pain items (out of 50), so the best pain score is 0 and the worst is 50. The functional sub-score contains six specific activity items and four usual activity items and is rated as 0 = no difficulty in performing the activity, and 10 = unable to perform the activity. The function score corresponds to the sum of the 10 function items divided by two (out of 50). Thus, the

best functional score is 0 and the worst is 50. The total PRW/HE score is equal to the sum of pain plus the function score, and is totaled out of 100, where pain and disability are equally weighted. [11]

Translation and cross-cultural adaptation:

Translation and cross-cultural adaptation were applied according to the guidelines of FACIT translation methodology [19] that contains 6 stages to be carried out. Stage I is the forward translation consisting of an informed (medical background) and an uninformed (no medical background) translator with Thai as their mother tongue resulting in version T1 and T2. Stage II, a third independent translator accepts the two Thai versions by choosing the better and resolving discrepancies between them (T-12). Stage III, back translation of T-12 is adapted into English by bilingual English native speaker fluent in Thai language in order to produce BT-12 for discrepancies and to assess equivalence with the PRW/HE - English version. Stage IV, the most appropriate translation for each item or provide alternate translation were selected by three independent bilingual reviewers. Stage V, these recommendations are investigated by the coordinating team and the language coordinator until they are all finally approved. Stage VI, formation of a pre-final Thai-version of PRW/HE is pretested with Thai patients in hand therapy clinic. If the problems are detected from any items, their feedbacks allow modification in the translations and for indications of changes that may subsequently be made to the original source document. The final Thai- version of PRW/HE (PRW/HE-Thai) was obtained and then tested on patients to evaluate its comprehension, reliability and validity.

Patients and setting

One hundred forty-eight patients were proposed from OT hand therapy practices took parts in this study. All patients were adults with wrist or hand pain, postoperative or undergoing occupational therapy for wrist or hand dysfunction. The questionnaires were distributed to patients in two distinct times at an average interval of 14 days. The first session showed that the patients received written instructions and an explanation of the research study in which they were participating. They were asked to complete the PRW/HE-Thai 1 and the validated Thai version of the disabilities of the arm, shoulder and hand questionnaire (DASH-Thai)[10] onsite. In the second session, they were also asked to complete the PRW/HE-Thai 2.

Data analysis and Statistics

Reliability was evaluated by analyzing the internal consistency and the test-retest stability. Cronbach's alpha coefficient was applied to estimate the internal consistency. A value of 0.70 is good, 0.80 sufficient, and 0.90 excellent. [20] Test-retest stability is assessed with the use of the intraclass correlation coefficient between PRW/HE-Thai at baseline and follow-up. The value should reach >0.75 for the instrument to be considered stable. [21] Pearson correlation was used to analyze the validity between PRW/HE-Thai 1, PRW/HE-Thai 2 and the DASH-Thai. The correlations were basically relied on a predetermined hypothesis according to the relationship between the PRW/HE-Thai scores and the DASH-Thai. The result of the PRW/HE-Thai was expected to be approximately the same as the result of the DASH-Thai questionnaire.

Results

Assessment

The majority of patients in our study were female and mean age was 52-years-old. No patients had difficulty completing the PRW/HE-Thai questionnaire. All the patients considered the items of the PRW/HE-Thai questionnaire to be clear. The mean values and standard deviation of PRW/HE-Thai at baseline/follow-up and DASH-Thai total score are shown in Table 1. Mean PRW/HE-Thai pain-score decreased significantly from 25.17(SD 11.60) at baseline to 19.84(SD 11.02) at follow up, mean PRW/HE-Thai functional-score decreased significantly from 45.78(SD 26.12) at baseline to 37.27(SD 23.67) at follow up, mean PRW/HE-Thai total score decreased significantly from 71.18(SD 33.99) at baseline to 56.64(SD 31.56) at follow up are shown in Figure 1.

Table1. PRW/HE -Thai at baseline/ follow-up (test, re-test) for all patient (n = 148).

Item	Baseline		Follow-up	
	Mean	Standard deviation	Mean	Standard deviation
PRW/HE-Thai-pain score	25.17	11.60	19.84	11.02
PRW/HE-Thai-function score	45.78	26.12	37.27	23.67
PRW/HE-Thai total score	71.18	33.99	56.64	31.56
DASH-Thai total score	40.34	20.48		

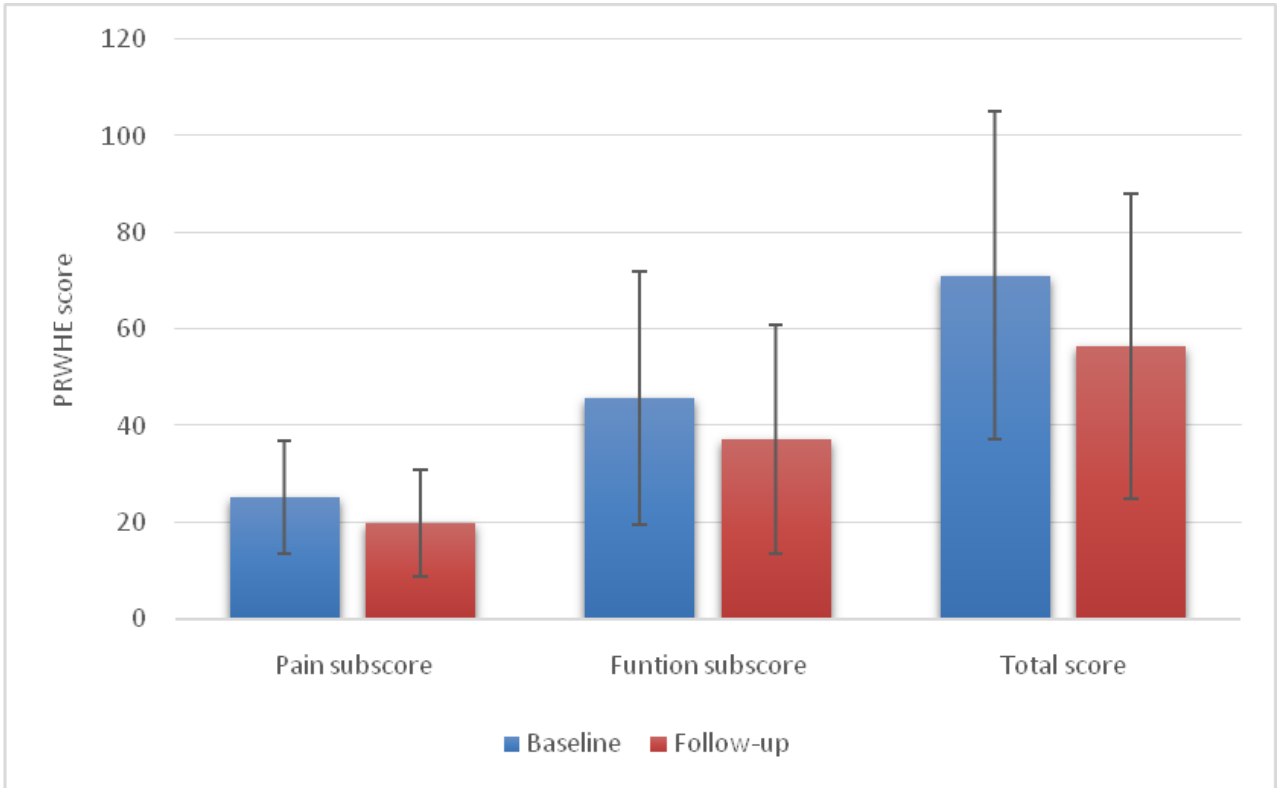

Figure 1. Mean values in test and re-test for pain sub-score, function sub-score and total score of the PRW/HE-Thai were significantly (n = 148).

Reliability

The internal consistency of the PRW/HE-Thai, estimated by Conbach's alpha was 0.89 for the pain score, 0.95 for the functional score and 0.94 for the total score. As for this analysis, it showed an excellent internal consistency that the test-retest stability was assessed by using intraclass correlation coefficient. The intraclass correlation coefficient of PRW/HE-Thai pain score, PRW/HE-Thai function score and PRW/HE-Thai total score were 0.88, 0.94, and 0.89, respectively. (Table 2).

Validity

Face validity was approved by members of the expert committee during the translation process. None of the patients reported difficulties in understanding the content of the questionnaire. The mean DASH-Thai score was 40.34 (SD 20.48) and PRW/HE-Thai score was 71.18 (SD 33.99) at baseline demonstrated that there is a very high correlation between the total scores of the both questionnaires ($r = 0.76$, $P < 0.01$).

Discussion

PRW/HE is a patient self-reported questionnaire, which is internationally, widely - used, wrist-hand specific. It has been translated into several European and Asian languages, [13-18] which has also been adapted to suit the culture of each country accordingly. In Southeast Asia countries, PRW/HE have been widely used in Singapore, in which they developed and made an evaluation for Chinese version of the PRW/HE. Therefore, they are effectively used among Chinese patients by hand therapists.[22] This study showed that PRW/HE-Thai are changed the expression in the second item for three aspects:1) Cutting meat using a knife in an affected hand: Using a spoon/fork/knife for a meal in an affected hand instead, in which they are practically used in Thai culture; 2) Carrying a ten lbs object in an affected hand: Using five kg object (1 rice sack), the metric system is changed according to the familiarity of Thai culture and simply explain in order to make a better understanding, in which the patient can estimate weight of the object seen in common life; 3) Use bathroom tissue with my affected hand: change to cleaning after using toilet in an affected hand due to Thai has individual cleaning method in each region. Thus, there is no need to specify the method. Test-retest reliability was assessed using ICCs, and was found to be high for pain, function, and total PRW/HE-Thai scores, all 148 patients understood the PRW/HE-Thai questionnaire well enough to answer them without difficulty. Internal consistency assessed by Cronbach's alpha coefficient was high for pain, function, and total PRW/HE-Thai scores, as was found

Table 2. Reliability of the PRW/HE-Thai.

Item	Conbach's alpha	ICC	95% CI
PRW/HE-Thai pain score	0.89	0.88	0.83 - 0.91
PRW/HE-Thai function score	0.95	0.94	0.91 - 0.96
PRW/HE-Thai total score	0.94	0.89	0.85 - 0.92

for the original version, and the Chinese, Swedish, German, Japanese, and Hindi versions. According to test validity of PRW/HE-Thai questionnaire, it is shown that validity coefficient was high when it was assessed with DASH – Thai questionnaire, DASH is a well-known and frequently used region-specific measure of the disable upper extremity but this questionnaire consists of as many as 30 items and has high demands for being considered completely filled out.[8] Cross-cultural adaptation and validation into Thai of this health-related functional outcome measure questionnaire can be specifically useful to the therapist in hand clinic by providing them with a standardized tool that is easy to administer and score in the clinic and simpler for patient to complete too.

Conclusions

We conclude that the PRW/HE-Thai is a reliable and valid instrument equivalent to the original English- PRW/HE. The PRW/HE-Thai can be a useful tool for assessing the outcome in future clinical studies. It is suitable as a follow-up instrument for professionals in clinical practices. Although in future studies, the questionnaire should also be compared to objective measurements.

Acknowledgements

We would like to thank Somsak Sriborisutsakul, PhD, Pravit Kitidumrongsook, MD, and Kawee Pataradool, MD for language editing of the questionnaire.

References

1. Case-Smith J. Outcome in hand rehabilitation using occupational therapy services. Am J Occup Ther 2003; 57: 499-506.
2. MacDermid JC, Stratford P. Applying evidence on outcome measures to hand therapy practice. J Hand Ther 2004 ;17:165-73.
3. Cooper C. Hand impairments. In: Trombly CA, Radomski MV, Eds. Occupational Therapy for physical dysfunction. 5th ed. Philadelphia: Lippincott Williams & Wilkins, 2002: 927-64.
4. Melvin JL. Roles and functions of occupational therapy in hand rehabilitation. Am J Occup Ther 1985;39:795-8.
5. Changulani M, Okonkwo U, Keswani T, Kalairajah Y. Outcome evaluation measures for wrist and hand: which one to choose? Int Orthop 2008;32: 1-6.
6. Schoneveld K, Wittink H, Takken T. Clinimetric. Evaluation of measurement tools used in hand therapy to assess activity and participation. J Hand Ther 2009; 22:221-35.
7. Hudak PL, Amadio PC, Bombardier C. Development of an upper extremity outcome measure: the DASH. Am J Int Med 1996; 29: 602-8.
8. MacDermid JC, Tottenham, V. Responsiveness of the disability of the arm, shoulder, and hand (DASH) and patient-rated wrist/hand evaluation (PRWHE) in evaluating change after hand therapy. J Hand Ther 2004;17:18-23.
9. Gummesson C, Atroshi I, Ekdahl C. The disabilities of the arm, shoulder and hand (DASH) outcome questionnaire: longitudinal construct validity and measuring self-rated health change after surgery. BMC Musculoskeletal Disorder 2003;12:349-62.
10. Tongprasert S, Rapipong J, Buntragulpoontawee M. The cross-cultural adaptation of the DASH

questionnaire in Thai (DASH-Th). J Hand Ther 2014;27:49-54.

11. MacDermid JC, Turgeon T, Richards RS, Beadle M, Roth JH. Patient rating of wrist pain and disability: a reliable and valid measurement tool. J Orthop Trauma1998;12: 577-86.
12. MacDermid JC, Tottenham, V. Responsiveness of the disability of the arm, shoulder, and hand (DASH) and patient-rated wrist/hand evaluation (PRWHE) in evaluating change after hand therapy. J Hand Ther 2004;17: 18-23.
13. Wah JW, Wang MK, Ping CL. Construct validity of the Chinese version of the Patient-rated Wrist Evaluation Questionnaire (PRWE-Hong Kong Version). J Hand Ther 2006;19:18-26.
14. Imaeda T, Uchiyama S, Wada T, Okinaga S, Sawaizumi T, Omokawa S, et al. Reliability, validity, and responsiveness of the Japanese version of the patient-rated wrist evaluation. J Orthop Sci 2010;15:509-17.
15. Mehta SP, Mhatre B, Macdermid JC, Mehta A. Cross-cultural adaptation and psychometric testing of the Hindi version of the patient-rated wrist evaluation. J Hand Ther 2012;25: 65-77.
16. John M, Angst F, Awiszus F, Pap G, Macdermid JC, Simmen BR. The patient rated wrist evaluation (PRWE): cross-cultural adaptation into German and evaluation of its psychometric properties. Clin Exp Rheumatol 2008; 26: 1047-58.
17. Wilcke MT, Abbaszadegan H, Adolphson PY. Evaluation of a swedish version of the patient-rated wrist evaluation outcome questionnaire: good responsiveness, validity, and reliability, in 99 patients recovering from a fracture of the distal radius. Scand J Plast Reconstr Surg Hand Surg 2009;43: 94-101.
18. Fairplay T, Atzei A, Corradi M, Luchetti R, Cozzolino R, Schoenhuber R. Cross-cultural adaptation and validation of the Italian version of the patient-rated wrist/hand evaluation questionnaire. J Hand Surg Eur 2012; 37: 863-70.
19. Eremenco SL, Cella D, Arnold BJ. A Comprehensive method for the translation and cross-cultural validation of health status questionnaires. *Eval Health Prof* 2005;28:212-32.
20. Nunnally JC, Bernstein IH. *Psychometric theory*. 3rd ed. New York, NY: McGraw -Hill.1994: 275-80.
21. Rosner B. Fundamental of biostatistics. 5th ed. Pacific Grove, California. Duxbury Thomson Learning. 2000.
22. Xu W, Seow C. Chinese version of the patient rated wrist evaluation (PRWE): Cross-cultural adaptation and reliability evaluation. J Hand Ther 2004;17:84-5.