

CROSS-CULTURAL ADAPTATION AND VALIDATION OF THE INTERNATIONAL KNEE DOCUMENTATION COMMITTEE SUBJECTIVE KNEE FORM IN FILIPINO

Angel Luis Ungson Veloso, MD-MBA
Edsel Arandia MD, FPOA

ABSTRACT

INTRODUCTION

The International Knee Documentation Committee (IKDC) Subjective Knee Form is a valid Patient-Reported Outcome Measure to evaluate ligamentous and meniscal knee injuries. Cross cultural adaptation and validation for the Filipino population should be carried out for the IKDC subjective form due to a change in language, culture and country.

OBJECTIVES

The primary objective of this study was to perform cross-cultural adaptation and determine the clinimetric properties of the Filipino IKDC Subjective Knee Form

METHODS

This was a cross sectional analytical study that examined the clinimetric properties of the Filipino Version of the IKDC subjective form. A Filipino IKDC subjective form was translated and cross-culturally adapted. The process consisted of a forward translation, backward translation, review of versions by an expert committee, modification of the Draft Filipino version and pre-testing the Initial Filipino version. The clinimetric properties of the "final" Filipino IKDC subjective form, namely face and content validity, construct validity, internal consistency and test-retest reliability were measured from 101 respondents. Face and Content validity were explored with questionnaires, internal consistency was assessed with Cronbach Alpha, test-retest reliability was measured with interclass correlation coefficients and construct validity was analyzed by comparing Filipino IKDC subjective form scores of respondents with injured knees with respondents with healthy knees.

RESULTS

The Filipino version of the IKDC subjective form has internally good clinimetric properties. Content validity showed that all items of the Filipino Version of the IKDC subjective form were perceived to be highly relevant by experts. Face validity showed that the participants graded the questionnaire items as easy understand and relevant to their condition. Internal consistency, test-retest reliability and were interpreted as excellent and acceptable, respectively.

CONCLUSION

The Filipino IKDC subjective knee form is both a valid and reliable PROM to evaluate knee pain and function of Filipino patients with ACL injuries

INTRODUCTION

The International Knee Documentation Committee Subjective Knee Form has been validated, developed and documented in literature as a valid patient reported outcome measure (PROM) to evaluate ligamentous and meniscal knee injuries. (1-4) The domains included in the IKDC subjective are pain, activities of daily living and sport and/or recreation. (2) In the past decade, there have been many studies validating translated IKDC subjective forms from various countries across different continents. Each of their respective authors cross culturally adapted and performed validity and reliability testing on their respective translated IKDC subjective form. (5-15)

According to Beaton et al. (16) cross-cultural adaptations and translation of established PROMs made for use in the English language should be done in certain scenarios. Specifically, for the Philippines, due to the change in language, culture and country of use, a translation and cross-cultural adaption is warranted for the IKDC subjective. A cross-cultural adaptation and translation ensures the translated version of the scale is linguistically and culturally accepted, this however does not correspond to the validity and reliability of the translated PROM.(16-19) The primary objective of this study was to perform cross-cultural adaptation and determine the clinimetric properties of the Filipino International Knee Documentation Committee Subjective Knee Form.

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METHODS

STUDY DESIGN

This was a translation and validation study that examined the clinimetric properties of the created Filipino Version of the IKDC subjective form. The study was conducted prospectively at the Philippine Orthopedic Center from January 2020 to November 2022.

TRANSLATION AND CROSS-CULTURAL ADAPTATION PHASE

As described in the paper of Beaton et al (16), 5 general steps were followed to create the culturally adapted Filipino Version of the IKDC subjective form. In the forward translation phase, two bilingual Filipinos drafted separate Filipino IKDC subjective forms, which were consolidated to create the initial Filipino IKDC subjective form. A separate professor from the Department of Filipino and Philippine Literature, University of The Philippines, Diliman then performed a back translation of the Initial Filipino IKDC subjective form. The initial Filipino IKDC subjective form and the back translated initial Filipino IKDC subjective form were reviewed by an expert committee consisting of 3 consultants from the Sports Section of the Philippine Orthopedic Center, the Assistant Chairperson and a Professor from The Department of Filipino and Philippine Literature, University of The Philippines, Diliman and a Methodologist. The expert committee reviewed the previous drafts to create the Final Draft of the Filipino IKDC subjective form.

PRE TESTING AND MODIFICATION PHASE

Fifteen patients with ligamentous knee injuries from the Philippine Orthopedic Center and 3 Rehabilitation Medicine Consultants from the Philippine Orthopedic Center took part in the pre-testing of the Draft of the Filipino IKDC subjective knee form. Each of these respondents were asked to interpret the difficulty and comprehensibility of each item. The data collected from the pre-testing was reviewed and consolidated by a methodologist. An expert committee reviewed this data and modified the Filipino IKDC subjective knee form before utilizing in during the validation phase of the study.

VALIDATION AND RELIABILITY TESTING PHASE: PATIENTS AND PROCEDURES

24 patients diagnosed with ligamentous knee injuries were recruited for face validity testing. Participants were asked to rate items of the Filipino IKDC subjective form in terms of *difficulty to understand* and *relevance to their condition*. To tackle content validity, 10 Orthopedic

surgeons from the Philippine Orthopedic Center reviewed the Filipino IKDC subjective form. Each expert rated on item relevance, comprehensiveness and comprehensibility. A 4-point Likert scale was used to rate item relevance, while comment sections were available for comprehensiveness and comprehensibility.

A total of 67 respondents participated in the construct validity and reliability testing phase of the study. 49 respondents had ligamentous knee injuries diagnosed by the Sports Section of The Philippine Orthopedic Center and 18 were healthy respondents with no complaints regarding their knees. For test-retest reliability, both healthy and injured respondents were asked to answer the Filipino IKDC subjective knee form and then re-answered the same form 5-7 days after.

STATISTICAL ANALYSIS

Descriptive statistics were used to summarize the general and clinical characteristics of the participants. Frequency and proportion were used for categorical variables (nominal/ordinal), mean and standard deviation for normally distributed interval/ratio variables, and median and range for non-normally distributed interval/ratio variables. Intraclass Correlation Coefficient/ICC was used to determine the test-retest reliability of the IKDC subjective knee form. To assess the questionnaire's internal consistency, Cronbach's Alpha was utilized. Mann-Whitney U test and Chi-square test were used to determine the difference of mean, median and frequency between injured and healthy participants, respectively. All valid data was included in the analysis. Missing variables were neither replaced nor estimated. The Null hypothesis was rejected at 0.05 α -level of significance. R 4.2.2 was used for data analysis.

RESULTS

TRANSLATION AND CROSS-CULTURAL ADAPTATION, PRE TESTING

Cultural adaptation suggestions from the expert committee were noted for items 1, 5, 7 and 8 of the Filipino IKDC. For the choices of these items, Skiing and Tennis were changed to "pagbubuhat ng sako" and "pagbibisikleta" which translate to carrying a sack and riding a bicycle respectively.

During the pre testing and initial face and content validity testing, specifically for items 2 and 3 of the IKDC, participants had a hard time quantifying their subjective knee pain on a scale of 1-10. Thus, under the likert scale in the choice section of these items, phrases were added to aid the participant to quantify each aspect the of knee symptoms the item was asking them to grade. Although item 4 seemed straightforward in

its English form, in the pre testing phase, participants had difficult time differentiating between the initial choices “Wala/Kaunti/Katamtaman/Napakatigas/Labis-labis” The choices were changed to “walang paninigas o pamamaga, may kaunting nararamdamang paninigas o pamamaga, may paninigas o pamamaga ng tuhod, sobrang maga o sobrang tigas ang tuhod, hindi maigalaw and tuhod dahil sa pamamaga o paninigas.”

CONTENT VALIDITY

Four items of the Filipino IKDC were rated highly relevant by all experts, while the remaining items were rated highly relevant to quite relevant. None of the experts had any comments on Comprehensibility. For Comprehensiveness, comments on the items were regarding translation. The experts that took part of this study phase gave suggestions to improve comprehensibility of each item. These are summarized in Table 1.

FACE VALIDITY RESULTS

For Item difficulty, majority of the items were deemed easy to understand. Majority of the items were also deemed important to the respondents knee condition. Table 2 summarizes the comments from respondents for face validity.

TEST-RETEST RELIABILITY AND INTERNAL CONSISTENCY

To investigate the test-retest reliability of IKDC subjective knee form, ICC was computed. With a computed ICC of 0.998, the IKDC subjective knee form was shown to have excellent reliability (Table 3).

Cronbach’s alpha was computed to examine the internal consistency of IKDC subjective knee form. The instrument had a total of 10 items. IKDC subjective knee form was observed to have an acceptable internal consistency with a computed cronbach’s alpha of 0.7026 (Table 4).

SURVEY PROPER AND HYPOTHESIS TESTING VALIDITY

There were 67 respondents for the survey, 49 (73.13%) with injured knees and 18 (26.9%) with normal knees. The two groups were similar in terms of age and sex. Table 9 summarizes the data from this phase of the study. The IKDC subjective knee form score was able to discriminate between the two groups, with median scores at 51.72 for injured knees group and 100 for normal knee patients ($p < 0.001$). Table 5 summarizes the data from this phase of the study.

DISCUSSION

The Filipino version of the IKDC subjective form has internally good clinimetric properties. Content validity showed that all items of the Filipino Version of the IKDC subjective form were perceived to be highly relevant by experts. Face validity showed that the participants graded the questionnaire items as easy to understand and relevant to their condition. Internal consistency, test-retest reliability and were interpreted as excellent and acceptable, respectively.

TRANSLATION, CROSS-CULTURAL ADAPTATION AND PRE TESTING

The authors of the paper worked closely with the expert committee in creating the Final Version of the IKDC Filipino Subjective knee form. This allowed comments and suggestions from all phases of the study to be reviewed and consolidated into each subsequent version. Prior to administering the final IKDC subjective in Filipino in the reliability testing phase, items were shortened or rephrased to make each item simpler to understand.

FACE AND CONTENT VALIDITY

Majority of the participants from the face validity phase found the items comprehensible and relevant to their condition. The items rated as “difficult to understand” were the lengthier items of the IKDC which required respondents to spend more time reading compared to other items on the IKDC questionnaire.

The orthopedic surgeons that participated in the content validation phase graded all the items of the Filipino Version of the IKDC subjective form as highly relevant for evaluating ligamentous knee injuries. Majority of the comments focused the correct phrasing of the questions and responses. The types of comments made by the experts were grouped into two main categories: appropriate wording to describe knee symptoms and syntax. One respondent commented using “pagkalas ng tuhod” instead of “pagbigay ng tuhod.” How to phrase the term “pagbigay ng tuhod” which in the original English IKDC subjective form is “giving way in your knee” was discussed by the expert committee. It was agreed upon that “pagbigay ng tuhod” is appropriate an appropriate translation. The other comments on the syntax were reviewed by the Assistant Chairperson of The Department of Filipino and Philippine Literature, University of The Philippines, Diliman.

The changes incorporated into the Final Filipino IKDC subjective form prior to utilizing the tool in the reliability and construct validity testing are enumerated below. For item number 6, the choices were changed from oo

and hindi to “mayroon” and “wala”. The questions for items 1,5 and 7 were simplified to “Ano ang pinakakaya mong gawin na hindi sumasakit ang tuhod, ... nang hindi namamaga and tuhod and ... nang hindi bumibigay ang tuhod, respectively. For question 10, the phrase “paano mo titignan” was changed to “paano mo mamarkahan.”

RELIABILITY AND CONSTRUCT VALIDITY

Internal Consistency of the Filipino IKDC subjective form was acceptable with a computed cronbach's alpha of 0.7026. The collated results of the internal consistency scores from the study of the original IKDC subjective form and other papers of translated IKDC subjective knee forms compared to this study are tabulated in Table 6.

Test-retest reliability of the Filipino IKDC subjective knee form was found to be excellent with an ICC of 0.99. This value is comparable with other translation and validation studies of the IKDC with the Brazilian and Indonesian IKDC version having ICC = 0.99, the Dutch IKDC ICC = 0.96 and the Original IKDC, ICC = 0.95. The computed ICC for other translated IKDC subjective knee forms are seen in Table 6.

A study by Anderson et al. (23), collected the normative data for the IKDC form for around 5000 knees in the United States of America. 28% of respondents had injured knees while the remainder did not report history of knee problems. The study reported that respondents with a current unilateral knee problem, current treatment or history of knee surgery had lower scores than respondents without a history of knee problems. (23) Furthermore, Anderson et al (23) stated this was evidence for construct validity of the IKDC subjective knee form since the PROM is able to differentiate between patients with healthy knees and patients with injured knees.

The data from this current study is similar to the data collected by Anderson et al. in 2006. For the respondents of this current study, patients with knee injuries had lower scores than patients with healthy knees. The Filipino IKDC subjective knee form score was able to discriminate between the two groups, with median scores at 51.72 for the injured knees group and 100 for normal knee patients ($p < 0.001$).

RECOMMENDATIONS AND LIMITATIONS

Although, the data from this study found that the IKDC scores between individuals with injured knees and those with normal knees are significantly different, it only suggests that the Filipino IKDC has good construct validity. According to Mokking et al, to explore construct validity of a PROM, hypothesis testing regarding

“internal relationships, relationships to scores of other instruments, or differences between relevant groups” should be carried out. (23) To reiterate, the significant difference found between the Filipino IKDC scores of injured and normal participants from this study cannot be proof of construct validity in terms of difference between relevant groups because the Filipino IKDC subjective knee form does not have normative data.

Majority if not all the studies that have cross-culturally adapted and validated IKDC in different languages noted the lack of a “gold standard” questionnaire to measure knee function (1-4). Thus to measure construct validity, those studies utilized translated and validated knee PROMs in their native languages to evaluate the corresponding IKDC being validated.(5-15) A major limitation of this study is that these knee related PROMs do not have Filipino versions.

The Medical Outcomes Study 36-Item Short-Form Health Survey” (SF-36), although not a knee specific PROM, was also utilized by many authors to measure construct validity of the IKDC subjective knee form.(5-15) The Filipino Version of the SF-36 however was not accessible to the author of this study. Without other available knee PROMs in the Filipino Language, to properly explore construct validity of the Filipino IKDC subjective knee form created in this study, licensing and agreement to use the Filipino Version of the SF-36 should be obtained.

Aside from the clinimetric properties of the Filipino IKDC presented above, according to Mokking et al. in his papers discussing the process of determining clinimetric properties of Patient Reported Outcome Measures, validity and responsiveness should also be measured.(19, 24) Responsiveness is defined as the ability to “detect change over time in the construct to be measured.” (19,24) Thus to be able to measure responsiveness of the Filipino IKDC subjective knee form, it should also be administered to patients that will undergo ACL reconstruction surgery before and after surgery.

CONCLUSION

The Filipino IKDC subjective knee form is both a valid and reliable PROM to evaluate knee pain and function of Filipino patients with ACL injuries. Further research in responsiveness and construct validity can be made for the Filipino IKDC subjective form.

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TABLES

Table 1. Content Validity: Summary of comments regarding comprehensibility.

IKDC	Comments
Item 1	<ul style="list-style-type: none"> • Replace the word '<i>gaya</i>' to '<i>tulad ng</i>' • Consider changing item translation to: 'Anong gawain ang kaya mong isagawa nang walang pananakit sa tuhod?' • Consider replacing '<i>kadalasan</i>' to '<i>madalas</i>' • Response options are too wordy • Item may be too long • Consider replacing '<i>pinakanakayang gawain</i>' to '<i>pinaka-kayang gawain</i>'
Item 3	<ul style="list-style-type: none"> • Choices A and B aren't much different
Item 4	<ul style="list-style-type: none"> • Improve second option from '<i>2-3 kada linggo</i>' to '<i>2-3 beses kada linggo</i>' • Does not differ acute from chronic pain
Item 6	<ul style="list-style-type: none"> • Consider using '<i>Meron/Wala</i>' instead of '<i>Oo/Hindi</i>'
Item 7	<ul style="list-style-type: none"> • Consider another word for '<i>pagbigay</i>' (n=2) • Consider '<i>pagbigay</i>' replacing with '<i>pagkalas</i>'

Table 2. Face validity: Summary of items with comments

Items	Comments
1. Ano ang pinakinakayang gawain ang kaya mong isagawa nang walang pananakit sa tuhod?	<ul style="list-style-type: none"> • Lengthy question • Consider replacing '<i>antas</i>' to '<i>ano ang pinakakayang</i>'
4. Sa nakalipas na apat na linggo o simula nang magkaroon ka ng injury, gaano katigas o kamaga ang iyong tuhod	<ul style="list-style-type: none"> • Consider having 2 separate items for <i>tigas</i> and <i>maga</i>
5. Ano ang pinakakinakayang antas ng gawain ang kaya mong isagawa nang walang seryosong pamamaga ng tuhod?	<ul style="list-style-type: none"> • Lengthy question • Question sounds similar to item no.1
7. Ano ang pinakakinakayang antas ng gawain ang kaya mong isagawa nang hindi bumibigay ang inyong tuhod?	<ul style="list-style-type: none"> • Lengthy question • Question sounds similar to item no.1

Table 3. Test-retest reliability

	ICC	Interpretation	p-value
IKDC subjective knee form	0.998	Excellent	<.001

Table 4. Internal consistency

	Cronbach's Alpha	Interpretation
IKDC subjective knee form	0.7026	Acceptable

Table 5. Profile of respondents and hypothesis testing validity with survey proper

	Total (n=67)	Injured Knee (n=49)	Normal Knee (n=18)	p-value
	Frequency (%); Median (IQR)			
Age, years	30 (27-31)	29 (26-31)	31 (30-31)	.064§
Sex				.270†
Male	46 (68.66)	36 (73.47)	10 (55.56)	
Female	21 (31.34)	13 (26.53)	8 (44.44)	
Injured knee [n=49]				-
Left	27 (55.10)	27 (55.10)	-	
Right	22 (44.90)	22 (44.90)	-	
IKDC subjective knee form score [n=116]	67.816 (47.989- 94.253)	51.724 (37.931- 69.540)	100 (97.70-100)	<.001§

Statistical tests used: § - Mann-Whitney U test; †-Chi-square test.

Table 6. Properties of Different IKDC Subjective Forms

Study	Version	Test-Retest Reliability ICC	Cronbach-alpha
Fu and Chan (7)	Chinese	0.87	.97
Irrgang et al (5,15)	English	0.95	.92
Haverkamp et al (6)	Dutch	0.96	.92
Metsavaht et al (11)	Brazilian Portugese	0.99	.92
Lertwanich et al (13)	Thai	0.92	.92
Padua et al (12)	Italian	0.90	.91
Kim et al (8)	Korean	0.94	.91
Deviandri et al (15)	Indonesian	0.99	.90
Celik et al (5)	Turkish	0.91	.89
Crawford et al (22)	English	0.95	.77
Present Study	Filipino	0.99	.70

APPENDIX

A. Filipino International Knee Documentation Committee Subjective Knee Form

Patient Name: _____
(Apelyido) (Pangalan)

Petsa Ngayon: _____

Petsa ng Kapinsalaan: _____

Diagnosis: _____

Paki-bilugan kung aling tuhod ang apektado: Kanan Kaliwa

Panuto: Piliin ang naaangkop na puntos ayon sa kalagayan ng iyong tuhod. Lagyan ng 'X' ang kahon o ang numero na nakalaan para sa iyong sagot.

A: Sintomas

1. Ano ang pinakakaya mong gawin na hindi sumasakit ang tuhod?

- ☐ Sobrang nakakapagod na aktibidad gaya ng gawaing may kasamang pagtalon, o pagpihit ng tuhod gaya ng sa basketball o football (+4)
- ☐ Nakakapagod na aktibidad gaya ng mabibigat na trabaho, tulad ng pagbubuhat ng sako o pagbibisikleta (+3)
- ☐ Madadaling gawain gaya ng magaan na trabaho, o pagtakbo (+2)
- ☐ Kadalasang gawain gaya ng paglalakad o gawaing bahay (+1)
- ☐ Hindi magawa ang mga kilos na nabanggit sa taas dahil sa pananakit ng tuhod (+0)

2. Sa nakalipas na apat na linggo o mula nang madisrasya, gaano mo kadalas maramdaman ang pananakit sa tuhod?

0	1	2	3	4	5	6	7	8	9	10
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Hindi nararamdaman

2-3 beses kada linggo

Araw-araw

3. Kung nakaramdam ka ng pananakit sa tuhod, gaano ito kalala?

0	1	2	3	4	5	6	7	8	9	10
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Walang pananakit sa tuhod

Hindi napapansin ang kirot kapag nagtatrabaho

Kayang magtrabaho at natitiis ang kirot

Hindi kaya magtrabaho dahil sa kirot

4. Sa nakalipas na apat na linggo o simula nang magkaroon ka ng injury, gaano katigas o kamaga ang iyong tuhod?

- ☐ Walang paninigas o pamamaga (+4)
- ☐ May kaunting nararamdamang paninigas o pamamaga (+3)
- ☐ May paninigas o pamamaga ang tuhod (+2)
- ☐ Sobrang maga o sobrang tigas ang tuhod (+1)
- ☐ Hindi maigalaw ang tuhod dahil sa pamamaga o paninigas (+0)

5. Ano ang pinakakaya mong gawin nang hindi namamaga ang tuhod?

☐ Sobrang nakakapagod na aktibidad gaya ng gawaing may kasamang pagtalon, o pagpihit ng tuhod gaya ng sa basketball o football (+4)

☐ Nakakapagod na aktibidad gaya ng mabibigat na trabaho, tulad ng pagbubuhay ng sako o pagbibisikleta (+3)

☐ Madadaling gawain gaya ng magaan na trabaho, o pagtakbo (+2)

☐ Kadalasang gawain gaya ng paglalakad o gawaing bahay (+1)

☐ Hindi magawa ang mga kilos na nabanggit sa taas dahil sa pananakit ng tuhod (+0)

6. Sa nakalipas na apat na linggo o simula nang magkaroon ka ng pananakit ng tuhod, may pakiramdam bang sumasabit o naglock ang iyong tuhod?

☐ Mayroon (+0)

☐ Wala (+1)

7. Ano ang pinakakaya mong gawin na hindi bumibigay ang tuhod?

☐ Sobrang nakakapagod na aktibidad gaya ng gawaing may kasamang pagtalon, o pagpihit ng tuhod gaya ng sa basketball o football (+4)

☐ Nakakapagod na aktibidad gaya ng mabibigat na trabaho, tulad ng pagbubuhay ng sako o pagbibisikleta (+3)

☐ Madadaling gawain gaya ng magaan na trabaho, o pagtakbo (+2)

☐ Kadalasang gawain gaya ng paglalakad o gawaing bahay (+1)

☐ Hindi magawa ang mga kilos na nabanggit sa taas dahil sa pananakit ng tuhod (+0)

B: Gawaing Pang-sports

8. Ano ang pinakakaya mong salihang aktibidad na madalas?

☐ Sobrang nakakapagod na aktibidad gaya ng gawaing may kasamang pagtalon, o pagpihit ng tuhod gaya ng sa basketball o football (+4)

☐ Nakakapagod na aktibidad gaya ng mabibigat na trabaho, tulad ng pagbubuhay ng sako o pagbibisikleta (+3)

☐ Madadaling gawain gaya ng magaan na trabaho, o pagtakbo (+2)

☐ Kadalasang gawain gaya ng paglalakad o gawaing bahay (+1)

☐ Hindi magawa ang mga kilos na nabanggit sa taas dahil sa pananakit ng tuhod (+0)

9. Paano naaapektuhan ng iyong tuhod ang kakayahan mo na:

	Hindi Mahirap (+4)	May Kaunting Hirap (+3)	Medyo Mahirap (+2)	Labis Na Mahirap (+1)	Hindi Kayang Gawin (+0)
Umakyat ng hagdan					
Bumaba ng hagdan					
Lumuhod					
Mag-squat					
Umupo nang nakalapat ang paa sa sahig at nakatiklop ang tuhod					
Tumayo mula sa pagkakaupo					
Tumakbo					
Tumalon at ilukso ang apektadong tuhod					
Huminto at biglang kumilos					

C: Gamit At Pang-Araw-Araw Na Pamumuhay

10. Paano mo mamarkahan ang kakayahan ng iyong tuhod mula 0 hanggang 10, kung saan ang 10 ay walang problemang nagagamit ang tuhod at ang 0 ay hindi nagagamit sa pang araw-araw na gawain pati na sa sports?

Kakayahan ng iyong tuhod bago ito nasaktan:

Hindi magawa ang pang-araw- araw na gawain	0	1	2	3	4	5	6	7	8	9	10	Walang limitasyon ang pang-araw- araw na gawain
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Kakayahan ng iyong tuhod bago ito nasaktan:

Hindi magawa ang pang-araw- araw na gawain	0	1	2	3	4	5	6	7	8	9	10	Walang limitasyon ang pang-araw- araw na gawain
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-KATAPUSAN NG PAGSUSURI-