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Cross-Cultural Adaptation and Psychometric Properties Testing of the Arabic Anterior Knee Pain Scale

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Background: PFPS is one of the most frequently occurring overuse injuries affecting the lower limbs. A variety of functional and self-reported outcome measures have been used to assess clinical outcomes of patients with PFPS, however, only the Anterior Knee Pain Scale (AKPS) has been designed for PFPS patients.

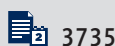
Material/Methods: We followed international recommendations to perform a cross-cultural adaptation of the AKPS. The Arabic AKPS and the Arabic RAND 36-item Health Survey were administered to 40 patients who were diagnosed with PFPS. Participants were assessed at baseline and after 2 to 3 days assessed with the Arabic AKPS only. The measurements tested were reliability, validity, and feasibility.

Results: The Arabic AKPS showed high reliability for both temporal stability, internal consistency (Cronbach's alpha was 0.81 for the first assessment and 0.75 for the second), excellent test-retest reliability (Intraclass Correlation Coefficients ICC=0.96; 95% confidence interval (CI): 0.93, 0.98) and good agreement (standard error of measurement SEM=1.8%). The Arabic AKPS was significantly correlated with physical components of the RAND 36-Item Health Survey (Spearman's rho=0.69: $p<0.001$). No ceiling or floor effects were observed.

Conclusions: The Arabic AKPS is a valid and reliable tool and is comparable to the original English version and other translated versions.

MeSH Keywords: **Anterior Knee Pain • Arabic Version • Patellofemoral Pain Syndrome • Outcome Measures • RAND 36-Item Health Survey • Scoring of Patellofemoral Disorders**

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Background

Patellofemoral pain syndrome (PFPS) is one of the most frequently occurring overuse injuries affecting the lower limbs [1] and is especially prevalent in people who are physically active [2,3]. The syndrome is manifested by either retropatellar or peripatellar pain, or both, as a result of activities that involve loading of the lower extremity when an individual walks, runs, jumps, climbs stairs and sits or kneels for a prolonged period [4]. The major symptom of PFPS is pain [5] and it usually progresses to impairment of function. Based on the fundamental theoretical framework and existing research, number of factors such as weakness of the muscles, structural as well as biochemical alterations of the lower limbs, the way an individual moves and cognitive factors contribute to the development of PFPS [6,7].

There are numerous etiologies responsible for either PFPS, with different patients displaying different underlying pathology [8]. Some individuals can have poor patella tracking due to underlying biomechanical etiology. On the other hand, some individuals can have a normal profile of the femoral or tibial bone and manifest with tibiofemoral-patellofemoral joint anatomical features. Anterior knee pain is linked with patella tracking that occurs laterally in the femoral trochlea [9].

Numerous functional and patient self-reported outcome (PRO) measures had been applied in the assessment of clinical outcomes following patellar dislocation or anterior knee pain [10]. Most of those measurements were initially designed for people with joint disorders that are non-patellafemoral. The Kujala Patellofemoral Disorder Score, also known as AKPS was particularly designed and developed for the assessment of patients having anterior knee pain as well as patellofemoral conditions [11]. This outcome measurement was subsequently demonstrated to be reliable, valid and responsive to patients with anterior knee pain and patellar instability [10,12,13]. Since, direct translation of a questionnaire from one language to another, may not be scientifically sound for clinical and research purposes, the standard AKPS written in English must be validated and adapted for use in an Arabic speaking population. This can be achieved by translating the Patient Report Outcome (PRO) measures in Arabic, then correlating the psychometric properties of the new version against the original version [14]. The standard AKPS is widely used globally, and has shown strong representation of psychometric and normative data patterns seen in English speaking populations [11]. It has been translated to different cultural settings and into many languages, including Turkish [15], Persian [16], Chinese [17], Dutch [18], and Brazilian-Portuguese [19]. Data compiled from questionnaires targeting different cultures are useful in establishing a better understanding of the instrument's strengths and limitations. The aim of this study was to translate, develop

a cross-cultural adaptation, and perform psychometric properties testing of the Arabic version of the Anterior Knee Pain Scale (AKPS) in patients with PFPS.

Material and Methods

Cross-cultural adaptation

The cross-cultural adaptation was conducted in two major stages: translation and cross-cultural adaptation and assessment of psychometric properties. The first stage was performed according to the guidelines published for the translation and cross-cultural adaptations of health-related questionnaires [20,21] and adopted by the American Orthopedic Surgeons Association (AOSA). The second stage employed the use of quality criteria for assessing properties of the questionnaire [22]; this included: (1) translation, (2) synthesis, (3) back-translation, (4) expert committee review, (5) pretesting, and (6) validation.

The initial translation

The initial stage in the process was forward translation of the AKPS. Two independent Arabic speakers who were native and also spoke fluent English translated the AKPS, which was in English, into Arabic. One translator was aware of the questionnaire concept, while the other was not. That strategy utilized version T1 which was the conceptual translation of the outcome being measured and version T2, that was a reflection of the linguistic practice which was not only standard but also without a scholarly influence [20].

The synthesis

The authors of this study and the two translators compared and synthesized versions T1 and T2 of the instrument and then produced Arabic versions of each measurement: the initial draft of the Arabic language version, developed as T12 [20].

Back translation

Two professional translators who spoke both Arabic and English and did not know what the instrument measured translated version T12, the initial translation of the instrument into Arabic, back into English. These back-translations were titled versions B1 and B2, and compared with the initial English versions [20].

Expert committee review

A committee of three rehabilitation specialists who were bilingual in Arabic and English was established. The translators (described previously) assisted the committee members whenever the need arose. Each of the committee members

independently evaluated the semantic, idiomatic, experiential and conceptual equivalence of each item on the questionnaire. During that analysis process, the members were given the original English version of the AKPS scale, the Arabic version that was forward translated and the English version that was back translated. When a nonequivalent item was identified, the committee reviewed it until a conclusion was made and the final version of the instrument was adapted for use in Arabic culture [20].

The pretesting

The adapted Arabic version of the instrument was tested for cultural equivalence. In that stage, an option labeled “not applicable” was included in every item of the Arabic version of the scale in order to recognize questions that Arabs would not understand or activities they would not perform often [23]. The “not applicable” option was used in pretesting and was removed from the final version of the instrument. After the survey was finalized, 15 patients diagnosed with PFPS who were receiving physical therapy treatment in Prince Sultan Medical City completed the questionnaire.

Later, the patients were asked about any difficulties they encountered while completing the questionnaire, and patients participated in a discussion about items that were “not applicable” or questions the patients did not answer. To develop the final Arabic version of AKPS, a 15% upper limit was set for the number of unanswered questions and “not applicable” items [20].

Validation

The assessment of psychometric properties was based on the quality criteria used to assess properties of the questionnaire [22]. The details and results of the validation study of the Arabic version of the AKPS are provided in the next sections.

Patients

Forty volunteers native Arabic speakers with PFPS were recruited from the Prince Sultan Military Medical City in Riyadh and the Prince Faisal Bin Fahad Hospital in Riyadh. They completed both Arabic versions of the AKPS and the RAND 36-Item Health Survey at baseline and the Arabic AKPS only 48 to 72 hours later. The mean \pm SD age of the participants was 34.7 \pm 9.31 years. The majority of participants were males (65%, n=26), and 67.5% (n=27) reported pain in the right knee (Table 1).

All patients were diagnosed by either general practitioners or an orthopedist. Inclusion criteria were as follows: age between 18 and 45 years old with untreated PFPS and symptoms for longer than two months. A range of ages was chosen to avoid difficulties in differentiating between PFPS, late symptoms of

Table 1. Summary characteristics of the participants.

	Study sample N=40	
Gender*		
Male	26	(65%)
Female	14	(35%)
Age (Years)	34.7 \pm 9.3	
Knee*#		
Right	27	(67.5%)
Left	13	(32.5%)
Duration (Months)	7.9 \pm 6.1	

* Values represented as n (%). # Bilateral affected sides we ask the patient to complete the questionnaires for more symptomatic side.

apophysitis (Osgood-Schlatter’s disease) and early symptoms of osteoarthritis. Patients included in the study were experiencing anterior or retropatellar pain from at least two of the following activities: prolonged sitting, stair climbing, squatting, running, kneeling and hopping/jumping, with symptom onset unrelated to a traumatic incident and experienced pain on palpation of the patellar facets or a positive physical symptoms on Waldron’s test [4,24,25]. We excluded patients with other knee injuries or pathology, such as knee osteoarthritis/ arthritis, previous knee injury or knee operation, patellar tendinopathy and Osgood-Schlatter’s disease.

Instruments

The AKPS, which is sometimes known as the Kujala Scale [11], is a self-report questionnaire with 13 items that are knee-specific. It documents patients’ responses about six activities such as walking, running, jumping, climbing stairs, squatting, and sitting for a long period. The AKPS also documents symptoms such as limping, inability to bear weight in the affected extremity, swelling, abnormal movement of the patellar, muscle atrophy, and limited flexion of the knees. Based on the patient’s answers, a score between zero and 100 is given, with the lowest score indicating severe pain or disability. The scoring of the scale is hierarchical, using categories such as “absence of difficulty – not able” or “absence of pain – presence of severe pain.” Some sections included scoring the distance that the patient can either walk or run without pain. The AKPS is easy to understand and administer and can be completed quickly [26]; the test-retest reliability is good [11,27]. The authors of the AKPS scale have demonstrated its validity [11,27] and its sensitivity has been examined by numerous authors [12,26,28] (Appendixes 1, 2.)

Another scale used in this study was the Arabic RAND 36-Item Health Survey. The instrument, a multipurpose short survey

with 36 questions, has eight subscales for assessing a person's physical and mental health. The physical component (PCS) includes: physical functioning, physical role functioning, bodily pain, and general health. The mental component (MCS) includes: vitality, social functioning, emotional role, and mental health. The score of this scale ranges from 0 to 100 (higher scores indicating better health status). It has been validated in Arabic [29] (Appendixes 3, 4).

Procedures

Patients participating in this study signed the consent form and were briefed about the study procedures at every stage. The study was approved by the Institutional Review Board (IRB) of Loma Linda University and the Ethical Committee of the Prince Sultan Military Medical City in Riyadh, Saudi Arabia. The first session involved completing the Arabic version of both the AKPS and the RAND 36-Item Health Survey. In the event that a patient had PFPS on both limbs, the patient completed the questionnaires for the more symptomatic side [12,26]. The Arabic AKPS was given again 48 to 72 hours after the initial session to assess for test-retest reliability [12,30]. This time interval was chosen because it is not long enough for participant's health status to be altered but long enough for participants to have forgotten the earlier responses of the initial session [12,26]. For convergent validity we hypothesized a strong and moderate correlation between both the Arabic AKPS and the physical components of the RAND 36-Item survey (physical functioning, role-physical, bodily pain, and general health) [22]. To assess divergent validity we hypothesized a weak correlation between both the Arabic AKPS and the mental components of the RAND survey (vitality, social functioning, role-emotion, and mental health) because those measure different constructs. Finally, to assess feasibility, ceiling and floor effects were measured [22]. The questionnaires were considered to have ceiling and floor effects if 15% of participants had the theoretical maximum or minimum total scores [31].

Statistical analyses

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS). A sample size of 40 patients was required for a power of 80% and an alpha of 0.5 to carry out this study. The two scales used in the study were examined for internal consistency, test-retest reliability, construct validity, and feasibility. Using the Cronbach's alpha index, we were able to assess the internal consistency of the Arabic AKPS with values of 0.70 to 0.90 considered adequate [22]. For test-retest reliability, interclass correlational coefficient (ICCs) and corresponding 95% confidence intervals (CIs) were calculated. ICCs that were less than 0.40 were considered poor, 0.4 to 0.7 were considered moderate, and 0.7 to 0.9 was considered substantial, while values above 0.9 were regarded as excellent [22].

Table 2. Mean \pm SD of total scores on the instruments.

	Study sample N=40
AKPS (0–100)	
At baseline	59.3 \pm 17.3
At 48 to 72 hours	59.0 \pm 16.1
RAND 36-Item	
PCS (0–100)	58.0 \pm 16.9
MCS (0–100)	76.7 \pm 12.6

AKPS – Anterior Knee Pain Scale; RAND 36-Item – RAND 36-Item Health Survey; PCS – Physical Components (physical functioning, role-physical, bodily pain, and general health); MCS – Mental Components (vitality, social functioning, role-emotional, and mental health).

Agreement was obtained by computing the standard error of measurement (SEM) from baseline assessment data and the assessment taken 48 to 72 hours later and expressed in similar units as the instrument used [12,30]. The SEM as a percentage of the total score provides a relatively good measure of agreement and is considered very good if it is $\leq 5\%$; good if it is between $>5\%$ and $\leq 10\%$, doubtful if between $>10\%$ and $\leq 20\%$ or negative if $>20\%$ [32]. Taking the standard deviation of differences between the scores from the two testing sessions and dividing by the square root of two yielded the SEM [33]. To obtain construct validity, the level of association was calculated using the Spearman's *rho* correlation between both the Arabic AKPS and the RAND 36-Item subscales at baseline. Correlation coefficients of ≥ 0.7 are recommended for same-construct instruments, while moderate correlations of ≥ 0.4 to ≤ 0.70 are acceptable [22]. We examined the ceiling and floor effects by calculating the percentage of participants who reached the highest or lowest possible scores in any instrument [22]. Ceiling and floor effects were confirmed to have occurred when more than 15% of all respondents obtained the lowest or highest possible score [22]. The level of significance was set at $p \leq 0.05$.

Results

Translations and cross-cultural adaptation

In the process of translating the AKPS into Arabic, we did not find any linguistic, semantic, or cultural differences and any inconsistencies were well illustrated and resolved amicably by the expert committee. During pretests all questions and options on cultural equivalence were well understood and answered satisfactorily by all 15 participants.

Table 3. Internal consistency of Arabic version of the Anterior Knee Pain Scale (n=40).

	Cronbach's Alpha if item deleted (baseline)	Cronbach's Alpha if item deleted (48 to 72 hours)
Q1	0.79	0.72
Q2	0.80	0.73
Q3	0.80	0.74
Q4	0.80	0.73
Q5	0.79	0.72
Q6	0.75	0.67
Q7	0.79	0.69
Q8	0.78	0.69
Q9	0.79	0.74
Q10	0.79	0.72
Q11	0.83	0.78
Q12	0.83	0.76
Q13	0.80	0.74
Overall Cronbach's Alpha	0.81	0.75

AKPS – Anterior Knee Pain Scale; Q – Question.

Measurements properties testing

All participants completed Arabic versions of both AKPS and the RAND 36-Item Health Survey at baseline and the Arabic AKPS only 48 to 72 hours later. The mean \pm SD of total scores on the instruments at baseline and 48 to 72 hours later are provided in Table 2.

Internal consistency

Results showed that the internal consistency of the Arabic version of AKPS, with a Cronbach α of 0.81 at baseline and 0.75 after 48 to 72 hours later. Deleting an item from the construct did not significantly change the alpha level. Values ranged from 0.75 to 0.83 when an item was deleted at baseline (Table 3).

Reliability

From test-retest reliability analysis, the Arabic AKPS showed excellent reliability (ICC=0.96: 95% CI: 0.93, 0.98). Also, analysis of individual ICC values ranged between 0.59 and 0.97. The percentage of the SEM to the total score was classified as very good (Table 4).

Construct validity

The Arabic AKPS was significantly correlated with physical components of the RAND 36-Item Health Survey ($\rho=0.69, p<0.001$) and RAND 36-Item subscales: physical functioning ($\rho=0.63$), role-physical ($\rho=0.57$) and bodily pain ($\rho=0.49$); only the

general health subscale was weak ($\rho=0.24$). For divergent validity, the correlation with mental components of the RAND-36 was not significant ($\rho=0.31, p=0.055$), showing a non-significant correlation with social functioning subscales ($\rho=0.22$), role-emotional ($\rho=0.34$) and mental health ($\rho=0.42$), and a strong correlation with vitality subscales ($\rho=0.53$) (Table 5).

Ceiling and floor effects

For this analysis, responses from participants at baseline and at 42 and 72 hours after baseline were used. None of the participants obtained the highest or lowest possible score on the Arabic AKPS; therefore, no ceiling or floor effects were observed at any of the assessment times. Regarding the RAND 36-Item, we observed a ceiling and floor effect in role-physical, while a floor effect only in vitality and role-emotional (Table 6).

Discussion

The purpose of this study was to translate, modify, and adapt the Anterior Knee Pain Scale (AKPS) to suit the Arab population culturally.

Translation process

The study was conducted using a sample of Arab-speaking patients with anterior knee pain. Results of this study showed that the Arabic version of the AKPS exhibited tolerable levels for reliability, validity, and feasibility and could be used as a

Table 4. Test-Retest of Arabic version of the Anterior Knee Pain Scale (n=40).

	ICC	Lower 95% CI	Upper 95% CI
Q1	0.96	0.93	0.98
Q2	0.95	0.91	0.97
Q3	0.60	0.36	0.77
Q4	0.71	0.51	0.83
Q5	0.79	0.64	0.88
Q6	0.86	0.75	0.92
Q7	0.92	0.86	0.96
Q8	0.78	0.62	0.88
Q9	0.62	0.39	0.78
Q10	0.97	0.95	0.99
Q11	0.74	0.57	0.86
Q12	0.85	0.73	0.92
Q13	0.59	0.35	0.76
Overall AKPS	0.96	0.93	0.98

AKPS – Anterior Knee Pain Scale; Q – Question; ICC – Intra Class Correlation.

Table 5. Spearman correlations between the Arabic version of the anterior knee pain scale and the RAND 36-Item subscales (n=40).

	AKPS	RAND 36-Item PCS	RAND 36-Item MCS
Physical functioning	0.63	0.83	0.36*
Role-physical	0.57	0.77	0.42
Bodily pain	0.49	0.66	0.41
General health	0.24*	0.53	0.27*
Vitality	0.53	0.42	0.57
Social functioning	0.22*	0.57	0.52
Role-emotional	0.34*	0.45	0.54
Mental health	0.01*	0.26*	0.78

AKPS – Anterior Knee Pain Scale; RAND 36-Item – RAND 36-Item Health Survey; PCS – Physical Components (physical functioning, role-physical, bodily pain, and general health); MCS – Mental Components (vitality, social functioning, role-emotional, and mental health).

* Not significant at an alpha of 0.01 level of significance.

subjective and functional assessment tool for Arab-speaking individuals presenting with AKP or PFPS.

The literature suggests that if possible it is preferable to use a scale developed in another language which had its reliability previously tested than to create a new instrument; in this way, the results can be compared with other studies [20]. Therefore, we chose to perform the cultural adaptation and validation of the Arabic AKPS in patients with patellofemoral pain syndrome (PFPS) in Saudi Arabia instead of creating a new questionnaire. There is consensus in the literature that a direct translation of a questionnaire into another language is not appropriate; for this reason we chose a translation protocol for maximum attainment of semantic, idiomatic, experiential,

and conceptual correspondence between the original and the translated questionnaire.

The process of translating and customizing a questionnaire to a different cultural group is not an easy one. It requires time, knowledge, skill and experience [34]. Certain conversational terms, idiomatic expressions, and emotional expressive terms may be challenging to translate. Whereas, reviews of literature and expert opinions are needed while formulating such tools, the importance of focus groups and patient involvement in the process of cultural adaptation of PRO cannot be underestimated [35]. In this study, we followed the guidelines of cross-cultural adaptations reported by Beaton et al. [20], and psychometric properties testing reported by Terwee et al. [22]. Translation

Table 6. Ceiling and flooring effects of Arabic version of the anterior knee pain scale and rand 36-item subscales (n=40).

	Ceiling effect (%)	Flooring effect (%)
AKPS	0	0
RAND 36-item summary		
Physical	0	0
Mental	0	0
RAND 36-item subscales		
Physical functioning	0	0
Role-physical	22.5*	37.5*
Bodily pain	2.5	0
General health	0	0
Vitality	2.5	2.5*
Social functioning	25	0
Role-emotional	70	10*
Mental health	5	0

AKPS – Anterior Knee Pain Scale; RAND 36-Item – RAND 36-Item Health Survey. * Ceiling and flooring effects by more than 15% of the participants.

Table 7. Overview of different reliability and validity tests that have been reported in the different language versions of the AKPS.

Study	Language version	Cronbach's Alpha Index	Test-retest reliability	Time interval
Present study	Arabic	0.81	0.96*	2–3 days
Kujala et al., 1993	Original Kujala	Not tested	–	–
Kuru et al., 2010	Turkish	0.84	0.94#	2 weeks
Negahban et al., 2012	Persian	0.81	0.96*	2–3 days
Cheung et al., 2012	Chinese	0.81	0.96*	7 days
Kievit et al., 2013	Dutch	0.81	Not tested	–
da Cunha et al., 2013	Brazilian-Portuguese	0.75	0.95*	2–3 days

* Intraclass Correlation Coefficient (ICC); # Spearman's correlation (rho).

and cross-cultural adaptation of the AKPS was performed in five stages: translation, synthesis, back translation, expert committee review, and pretesting. The role of the expert committee was crucial in the review of all translations, making critical decisions, reaching a consensus on any discrepancy, and putting together the different versions of the questionnaire.

The new tool was reviewed and modified at each point by the investigators and subjected to an additional review by the committee members to guarantee the quality of the final translation. The Arabic version did not need major or specific modifications and changes because the signs, symptoms, and activities evaluated by the scale are common in both English and Arabic populations. Also, the translation used simple

everyday words commonly used in Arabic. Even so, it remains challenging to align literal terms with dialectic ones. We observed that in the questions on “Abnormal painful kneecap (patellar) movements, Stairs, and Squatting” were not clear to all participants, so we placed an Arabic slang term (rather than a classical Arabic term) between parentheses to be clearer to participants. After the cross-cultural adaptation phase had been completed, the questionnaire still was not yet ready for use. Further tests should be conducted on the psychometric properties of the adapted questionnaire.

The most important findings of our study was that the Arabic AKPS demonstrated an excellent internal consistency, reliability, and acceptable construct validity; in addition, no ceiling

Table 8. Overview of different Spearman rank correlation coefficients of the total score of the AKPS scale and the RAND 36-Item that have been reported in the different language versions of the AKPS.

	This study	Persian (Negahban, et al. 2012)	Chinese (Cheung, et al. 2012)	Dutch (Kievit, et al. 2013)
Physical functioning	0.63	0.51	0.49	0.59
Role-physical	0.57	0.44	0.41	0.54
Bodily pain	0.49	0.47	0.14	0.22
General health	0.24*	0.34	0.44	0.37
Vitality	0.53	0.33	0.29	0.27
Social functioning	0.22*	0.37	0.22	0.46
Role-emotional	0.34*	0.25	0.13	0.57
Mental health	0.01*	0.35	0.16	0.33

AKPS – Anterior Knee Pain Scale; RAND 36-Item – RAND 36-Item Health Survey. * Non-significant at an alpha of 0.05.

or floor effects were observed in patients with anterior knee pain. Furthermore, this is the first study to translate the AKPS to Arabic and validate it for use in patients with anterior knee pain.

Reliability

Similar to other versions, the Arabic AKPS had good internal consistency ($\alpha=0.81$) [15–19]. Reliability testing is one of the most important of psychometric properties of an outcome measurement [12]. When we examined reliability, we used 48 to 72 hour intervals between the baseline session and the second session to give patients time to forget their initial responses and for symptoms not to vary substantially [12,30]. The Arabic version of the AKPS showed excellent reliability and very good agreement (ICC=0.96, 95% CI=0.93–0.98). These findings are in line with those obtained by studies of other versions of the instrument, Turkish [15], Persian [16], Chinese [17], Brazilian-Portuguese [19] and those conducted by Bennell et al. (ICC=0.96) [26], Crossley et al. [28], and Watson et al. (ICC=0.95) [12]. The original Kujala scale and Dutch version did not examine test-retest reliability. The variation in reliability observed among different studies may be due to length of time intervals, population differences, and the type of statistical approach used. The agreement assessed by the percentage of the SEM in relation to the total score range was rated as very good and was in agreement with findings from previous studies that used the AKPS [19,26,28] (Table 7.)

Validity

To verify the validity of the AKPS, we studied the content and construct validity: construct validity was examined by convergent and divergent validity, and content validity by ceiling and floor effects. We found a good correlation between Arabic AKPS and PCS of the RAND-36 Item subscales: physical functioning, role-physical, and bodily pain. A poor correlation

was found with the general health subscale. Divergent validity was expected and observed with the MCS of the RAND-36. These findings support our hypothesis that the AKPS and the PCS measure the same construct, while the AKPS and the MCS measure a different construct [22]. In this study, the correlation between the Arabic AKPS and the RAND-36 subscales of physical functioning, role-physical, and bodily pain were higher than that of the Persian [16], Chinese [17], and Dutch [18] versions. The correlation between the AKPS and the mental components of the RAND-36 were similar to the results found in other translated versions [16] (Table 8).

Feasibility

In this study, no ceiling and floor effect was seen for the Arabic version of the AKPS; therefore, the Arabic AKPS has the ability to distinguish between different patients based on their signs and symptoms. This parameter supports the reliability and responsiveness of the scale [22] and is comparable to other translated versions [15,17–19].

Findings from this study provide clinicians and researchers with evidence backing the use of an AKPS tool on Arabic speaking patients with PFPs by Arabic researchers in everyday clinical settings [36]. Having reliable and standardized instruments can improve the quality of research findings and enhance the value of scientific evidence since findings can be reported in a more unified way. This allows standardized comparison of findings through systematic reviews and meta-analysis [37]. In addition, this standardized instrument enhances the quality of pooled data from various parts of the world with dissimilar cultures. Our study was concluded with recommendations for future study. Due to time restraints we did not conduct an analysis of the responsiveness of the AKPS, which is defined as the ability of an instrument to detect important clinical changes through time [38]. Therefore, we feel that the measurement properties of the AKPS

are similar to the original version and the majority of the different versions available in the literature. We understand that evaluating a cross-culturally adapted instrument is an ongoing procedure, and believe that the present study laid the cornerstone for that process. Based on this assumption, we suggest further studies on the AKPS with the purpose of increasing its coverage and evaluating measurement properties yet unknown.

Conclusions

From our findings, the Arabic AKPS is sufficiently reliable, valid, and appropriate for use as a patient reported outcome measure for Arabic speaking individuals with anterior knee pain

Appendixes

and PFPS. It is also the first validated knee outcome measure in Arabic to assess knee pathology.

Statement

The study protocol was approved by IRB of Loma Linda University (# 5140007), Loma Linda, California, United States and the Ethical Committee of Prince Sultan Military Medical City, Riyadh, Kingdom of Saudi Arabia.

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APPENDIX 1

ANTERIOR KNEE PAIN (English Version)

ANTERIOR KNEE PAIN (Sheet code: _____)

Name: _____ Date: _____

Age: _____

Knee: L/R

Duration of symptoms: _____ years _____ months

For each question, circle the latest choice (letter), which corresponds to your knee symptoms.

1. Limp

- (a) None (5)
- (b) Slight or periodical (3)
- (c) Constant (0)

2. Support

- (a) Full support without pain (5)
- (b) Painful (3)
- (c) Weight bearing impossible (0)

3. Walking

- (a) Unlimited (5)
- (b) More than 2 km (3)
- (c) 1-2 km (2)
- (d) Unable (0)

4. Stairs

- (a) No difficulty (10)
- (b) Slight pain when descending (8)

- (c) Pain both when descending and ascending (5)
- (d) Unable (0)

5. Squatting

- (a) No difficulty (5)
- (b) Repeated squatting painful (4)
- (c) Painful each time (3)
- (d) Possible with partial weight bearing (2)
- (e) Unable (0)

6. Running

- (a) No difficulty (10)
- (b) Pain after more than 2 km (8)
- (c) Slight pain from start (6)
- (d) Severe pain (3)
- (e) Unable (0)

7. Jumping

- (a) No difficulty (10)
- (b) Slight difficulty (7)
- (c) Constant pain (2)
- (d) Unable (0)

8. Prolonged sitting with the knees flexed

- (a) No difficulty (10)
- (b) Pain after exercise (8)
- (c) Constant pain (6)
- (d) Pain forces to extend knees temporarily (4)
- (e) Unable (0)

9. Pain

- (a) None (10)
- (b) Slight and occasional (8)
- (c) Interferes with sleep (6)
- (d) Occasionally severe (3)
- (e) Constant and severe (0)

10. Swelling

- (a) None (10)
- (b) After severe exertion (8)
- (c) After daily activities (6)
- (d) Every evening (4)
- (e) Constant (0)

11. Abnormal painful kneecap (patellar) movements (subluxations)

- (a) None (10)
- (b) Occasionally in sports activities (6)
- (c) Occasionally in daily activities (4)
- (d) At least one documented dislocation (2)
- (e) More than two dislocations (0)

12. Atrophy of thigh

- (a) None (5)
- (b) Slight (3)
- (c) Severe (0)

13. Flexion deficiency

- (a) None (5)
- (b) Slight (3)
- (c) Severe (0)

APPENDIX 2

ANTERIOR KNEE PAIN (Arabic Version)

الاسم:.....العمر..... بداية الأعراض..... شهر / سنة

الزيارة: (١ - ٢) الركبة المصابة: اليمين / اليسار

(أكثر إيجابية واحدة وضع علامة (✓) أمام الإجابة المناسبة)

<p>٥) أثناء جلوسك القرفصه (القرقضاء)</p> <p><input type="radio"/> لا أواجه أي صعوبة</p> <p><input type="radio"/> أشعر بألم بعد تكرار القرفصه لعدة مرات</p> <p><input type="radio"/> أشعر بألم عند كل مره</p> <p><input type="radio"/> ممكن عند تحمل وزن جزئي</p> <p><input type="radio"/> لا أستطيع</p> <p>٦) أثناء الجري</p> <p><input type="radio"/> لا أواجه أي صعوبة</p> <p><input type="radio"/> أشعر بألم بعد الجري لأكثر من ٢ كيلومتر</p> <p><input type="radio"/> أشعر بألم خفيف منذ البداية</p> <p><input type="radio"/> أشعر بألم شديد</p> <p><input type="radio"/> لا أستطيع</p> <p>٧) أثناء القفز</p> <p><input type="radio"/> لا أواجه أي صعوبة</p> <p><input type="radio"/> أواجه صعوبة خفيفة</p> <p><input type="radio"/> أشعر بألم مستمر</p> <p><input type="radio"/> لا أستطيع</p>	<p>١) هل تمشي وانت تعرج (تضلع) ؟</p> <p><input type="radio"/> لا يوجد</p> <p><input type="radio"/> بصورة خفيفة أو أحياناً</p> <p><input type="radio"/> باستمرار</p> <p>٢) ما مدى تحمل ركبته لوزن جسمك؟</p> <p><input type="radio"/> تتحمل كل وزني</p> <p><input type="radio"/> تتحمل لكن أشعر بألم</p> <p><input type="radio"/> من المستحيل أن تتحمل وزني</p> <p>٣) أثناء المشي</p> <p><input type="radio"/> لا يوجد لدي حد للمشي</p> <p><input type="radio"/> أمشي أكثر من ٢ كيلو متر</p> <p><input type="radio"/> أمشي من ١ الي ٢ كيلو متر</p> <p><input type="radio"/> لا أستطيع</p> <p>٤) أثناء صعود او نزول الدرج (السلم)</p> <p><input type="radio"/> لا أواجه أي صعوبة</p> <p><input type="radio"/> أشعر بألم خفيف عند النزول</p> <p><input type="radio"/> أشعر بألم خفيف عند الصعود والنزول</p> <p><input type="radio"/> لا أستطيع</p>
---	--

<p>١١) حركات غير طبيعية وإجهاد لرضفة الركبة (صابوتة الركبة)</p> <p>○ لا توجد</p> <p>○ أحياناً أثناء الأنشطة الرياضية</p> <p>○ أحياناً أثناء الأنشطة اليومية</p> <p>○ حدث لي خلع مرة واحدة على الأقل</p> <p>○ حدث لي خلع أكثر من مرتين</p>	<p>٨) عند الجلوس وركبتك متباعدة لفترة طويلة</p> <p>○ لا أواجه أي صعوبة</p> <p>○ أشعر بالألم عند الجلوس بعد القيام بتمارين رياضية</p> <p>○ أشعر بالألم مستمر</p> <p>○ أشعر بالألم شديد</p> <p>○ لا أستطيع</p>
<p>١٢) ضمور الفخذ (حجم الفخذ)</p> <p>○ لا يوجد</p> <p>○ ضمور بسيط</p> <p>○ ضمور شديد</p>	<p>٩) الألم</p> <p>○ لا يوجد</p> <p>○ أشعر بالألم خفيف بعض الأوقات</p> <p>○ أشعر بالألم يزعجني أثناء النوم</p> <p>○ أشعر بالألم شديد أحياناً</p> <p>○ أشعر بالألم شديد و مستمر</p>
<p>١٣) مدى تأثر درجة التلي في الركبة المصابة</p> <p>○ لا يوجد</p> <p>○ بسيط</p> <p>○ شديد</p>	<p>١٠) التورم</p> <p>○ لا يوجد</p> <p>○ يوجد بعد جهد شديد</p> <p>○ يوجد بعد الأنشطة اليومية</p> <p>○ يوجد كل صباح</p> <p>○ مستمر</p>

APPENDIX 3

RAND 36-Item Health Survey (English Version)

Instructions for completing the questionnaire: Please answer every question. Some questions may look like others, but each one is different. Please take the time to read and answer each question carefully by filling in the bubble that best represents your response.

Patient Name: _____

Date: _____

1. In general, would you say your health is:

- Excellent
- Very good
- Good
- Fair
- Poor

2. Compared to one year ago, how would you rate your health in general now?

- Much better now than a year ago
- Somewhat better now than a year ago
- About the same as one year ago
- Somewhat worse now than one year ago
- Much worse now than one year ago

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

- Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.
- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

b. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf?

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

c. Lifting or carrying groceries.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

d. Climbing several flights of stairs.

- Yes, limited a lot.
- Yes, limited a little.

- No, not limited at all.

e. Climbing one flight of stairs.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

f. Bending, kneeling or stooping.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

g. Walking more than one mile.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

h. Walking several blocks.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

i. Walking one block.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

j. Bathing or dressing yourself.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

a. Cut down the amount of time you spent on work or other activities?

- Yes
- No

b. Accomplished less than you would like?

- Yes
- No

c. Were limited in the kind of work or other activities

- Yes
- No

d. Had difficulty performing the work or other activities (for example, it took extra time)

- Yes
- No

5. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

a. Cut down the amount of time you spent on work or other activities?

- Yes
- No

b. Accomplished less than you would like

- Yes
- No

c. Didn't do work or other activities as carefully as usual

- Yes
- No

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

- Not at all
- Slightly
- Moderately
- Quite a bit
- Extremely

7. How much bodily pain have you had during the past 4 weeks?

- Not at all
- Slightly
- Moderately
- Quite a bit
- Extremely

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

- Not at all
- Slightly
- Moderately
- Quite a bit
- Extremely

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks.

a. Did you feel full of pep?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

b. Have you been a very nervous person?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

c. Have you felt so down in the dumps nothing could cheer you up?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

d. Have you felt calm and peaceful?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time

- A little of the time
- None of the time

e. Did you have a lot of energy?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

f. Have you felt downhearted and blue?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

g. Did you feel worn out?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

h. Have you been a happy person?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

i. Did you feel tired?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

- All of the time
- Most of the time
- Some of the time
- A little of the time
- None of the time

11. How TRUE or FALSE is each of the following statements for you?

a. I seem to get sick a little easier than other people

- Definitely true
- Mostly true
- Don't know
- Mostly false
- Definitely false

b. I am as healthy as anybody I know

- Definitely true
- Mostly true
- Don't know
- Mostly false
- Definitely false

c. I expect my health to get worse

- Definitely true
- Mostly true
- Don't know
- Mostly false
- Definitely false

d. My health is excellent

- Definitely true
- Mostly true
- Don't know
- Mostly false
- Definitely false

APPENDIX 4

RAND 36-Item Health Survey (Arabic Version)

يحص نايبت سا

الاسم:

الجنس ذكر انثى

العمر سنة

 المؤهل العلمي: ابتدائي إحصائي تقوي بكالوريوس ماجستير دكتوراه

من فضلك، أجب على كل الأسئلة الموجودة في هذا الاستبيان، في حالة عدم وضوح أي سؤال، أرجو اختيار أقرب إجابة لمفهومك للسؤال.

(١) بصورة عامة، كيف ترى حالتك الصحية؟

(أختر إجابة واحدة وضع علامة (✓) أمام الإجابة المناسبة)

- ممتازة
- جيد جداً
- جيدة
- لا بأس بها
- سيئة

٢) مقارنة بعام مضى، كيف تقيم حالتك الصحية الآن بصورة عامة؟

(أختر إجابة واحدة وضع علامة (✓) أمام الإجابة المناسبة)

- أفضل بكثير مما كانت عليه قبل عام
- أفضل نوع ما من العام الماضي
- تقريباً على ما هي عليه
- أسوأ نوعاً ما من العام الماضي
- أسوأ بكثير مما كانت عليه قبل عام

(أختر إجابة واحدة وضع علامة (✓) تحت الإجابة

(المناسبة)

			-
			تتعلق البنود التالية بأنشطة يمكن أن تقوم بها خلال يومك العادي، في الوقت الحالي، إلى أي مدى تفيد حالتك الصحية:
لا تفيدني إطلاقاً	نعم تفيدني قليلاً	نعم تفيدني كثيراً	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	٣) من ممارسة الأنشطة الشاقة مثل: الجري، حمل الأثيياء الثقيلة أو مزاوله الأنشطة الرياضية المجهدة جداً؟
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	٤) من ممارسة الأنشطة متوسطة الجهد، كتحريك الطويلة في التنظيف باستخدام المكينة الكهربائية أو تنظيف حديقة المنزل والحديقة بها؟
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	٥) من حمل المشتريات من البقالة أو السوق المركزي (السوبر ماركت)؟
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	٦) من صعود الدرج لعدة أدوار؟
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	٧) من صعود الدرج لدور واحد فقط؟
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	٨) من الانحناء أو الركوع أو السجود؟
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	٩) من المشي لأكثر من كيلو مت ونصف؟
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	١٠) من المشي لمسافة نصف كيلو متر؟
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	١١) من المشي لمسافة متر؟
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	١٢) من الاستحمام أو ارتداء الملابس بنفسك؟

الصحة الجسمية

(أكثر إجابة واحدة وضع علامة (✓)
تحت الإجابة المناسبة)

لا	نعم	
		تتعلق البنود التالية (أ، ب، ج، د) بالمسائل التي يمكن أن تواجهك خلال تأديتك لعملك أو للأنشطة اليومية المتعددة نتيجة لحالتك الصحية الجسمية . خلال الأسابيع الأربعة الماضية، هل تسببت حالتك الصحية الجسمية في:
<input type="checkbox"/>	<input type="checkbox"/>	١٣) التقليل من الوقت الذي تخصصه في العمل أو أي أنشطة أخرى؟
<input type="checkbox"/>	<input type="checkbox"/>	١٤) التقليل مما تود انجازه من العمل أو أي أنشطة أخرى؟
<input type="checkbox"/>	<input type="checkbox"/>	١٥) تعييدك في أداء نوع معين من الأعمال أو أي أنشطة أخرى؟
<input type="checkbox"/>	<input type="checkbox"/>	١٦) أن تجد صعوبة في تأدية العمل أو أي أنشطة أخرى؟ (على سبيل المثال، احتجت إلى جهد إضافي لتأديتها)

الصحة النفسية

(أكثر إجابة واحدة وضع علامة (✓)
تحت الإجابة المناسبة)

لا	نعم	
		تتعلق البنود التالية (أ، ب، ج) بالمسائل التي يمكن أن تواجهك خلال تأديتك لعملك أو الأنشطة اليومية المتعددة كنتيجة لحالتك الصحية النفسية. (مثل الشعور بالاكئاب أو القلق) خلال الأسابيع الأربعة الماضية، هل تسببت حالتك الصحية النفسية في:
<input type="checkbox"/>	<input type="checkbox"/>	١٧) التقليل من الوقت الذي تخصصه في العمل أو أي أنشطة أخرى؟
<input type="checkbox"/>	<input type="checkbox"/>	١٨) التقليل مما تود انجازه من العمل أو أي أنشطة أخرى؟
<input type="checkbox"/>	<input type="checkbox"/>	١٩) عدم انجاز العمل أو أي أنشطة أخرى بالحرص المتعددة؟

الصحة الجسمية أو النفسية

٢٠) خلال الأسابيع الأربعة الماضية، إلى أي مدى تعارضت صحتك الجسمية أو النفسية مع تأديتك لنشاطاتك الاجتماعية المعتادة مع عائلتك أو أصدقائك أو جيرانك أو أي من المناسبات الاجتماعية الأخرى؟

(اختر إجابة واحدة وضع علامة (✓) أمام الإجابة الصحيحة)

- لم يكن هناك أي تعارض إطلاقاً
- كان هناك تعارض قليلاً
- كان هناك تعارض متوسط
- كان هناك تعارض كبير
- كان هناك تعارض كبير جداً

شدة الألم

(٢١) عما شدة الألم الجسدي الذي عانيت منه خلال الأسابيع الأربعة الماضية؟

(أختر إجابة واحدة وضع علامة (✓) أمام الإجابة المناسبة)

- لم يكن هناك أي ألم
- كان هناك ألم خفيف جداً
- كان هناك ألم خفيف
- كان هناك ألم متوسط
- كان هناك ألم شديد
- كان هناك ألم شديد جداً

(٢٢) خلال الأسابيع الأربعة الماضية، إلى أي مدى أدى الألم الجسدي إلى التعارض مع تأديتك لأعمالك المعتادة

(سواء داخل المنزل أو خارجه)

(أختر إجابة واحدة وضع علامة (✓) أمام الإجابة المناسبة)

- لم يكن هناك أي تعارض
- كان هناك تعارض قليل جداً
- كان هناك تعارض متوسط
- كان هناك تعارض كبير
- كان هناك تعارض كبير جداً

(أكثر إيجابية واحدة وضع علامة (✓) تحت الإجابة المناسبة)

الأسئلة التالية تتعلق بكيفية شعورك وطبيعة سير الأمور معك خلال الأسابيع الأربعة الماضية، الرجاء إعطاء إجابة واحدة لكل سؤال بحيث تكون الإجابة هي الأقرب إلى الحالة التي كنت تشعر بها خلال الأسابيع الأربعة الماضية. كم من الوقت:

لم أشعر	في قليل من الأوقات	في بعض الأوقات	في كثير من الأوقات	في معظم الأوقات	في كل الأوقات
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

٣٢) خلال الأسابيع الأربعة الماضية، ما مقدار الوقت الذي تعارضت فيه صحتك الجسمية أو مشاكلك النفسية مع نشاطاتك الاجتماعية (مثل زيارة الأصدقاء والأقارب وغير ذلك)؟

(أختر إجابة واحدة وضع علامة (✓) أمام الإجابة المناسبة)

- كان تعارض في كل الأوقات
- كان تعارض في معظم الأوقات
- كان تعارض في بعض الأوقات
- كان تعارض في قليل من الأوقات
- لم يكن هناك تعارض في أي وقت من الأوقات

(أختر إجابة واحدة وضع علامة (✓) تحت الإجابة المناسبة)

					ما مدى صحة أو خطأ كل من العبارات بالنسبة إلى حالتك الصحية؟
خطأ بلا شك	خطأ غالباً	لا أعلم	صحيحه غالباً	صحيحه بلا شك	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	٣٣) يبدو أنني أصعب بالمرض أسهل من الآخرين.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	٣٤) حالتي الصحية مساوية لأي شخص أعرفه.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	٣٥) أتوقع أن تسوء حالتي الصحية.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	٣٦) حالتي الصحية ممتازة.

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