

Translation and cross-cultural adaptation of the modified Short QUESTIONNAIRE to Assess Health-enhancing physical activity (mSQUASH) into Turkish

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Running head: Adaptation of mSQUASH into Turkish

Abstract

Aims: The aim was to translate and cross-culturally adapt the modified Short Questionnaire to Assess Health-enhancing physical activity (mSQUASH) into Turkish.

Methods: The mSQUASH was translated into Turkish and backward-translation into Dutch was performed afterwards using the Beaton method. After the Turkish version was reviewed and revised by an expert committee that included translators, two patients and the research team a pre-final version was produced. The-pre final version then entered a field-test with cognitive debriefing in 10 patients with axSpA. The final result was the Turkish mSQUASH version.

Results: The translation process went without difficulties. Small discrepancies were either resolved during the synthesis or expert consensus meetings. Mean (SD) time to complete the mSQUASH was 6.1 (2.4) minutes in field-test procedure. The cognitive debriefing showed that the items of the Turkish mSQUASH were clear, relevant, easy to understand and easy to complete. None of the patients reported that an important aspect of physical activity was missing from the questionnaire items. Patients raised the concern that not all sport examples were culturally suitable; tennis was replaced by volleyball and basketball after the cognitive debriefing, to make it more appropriate to the Turkish culture.

Conclusion: The final Turkish version of the mSQUASH showed acceptable linguistic and field validity for use in both clinical practice and research. However, further assessment of the psychometric properties (validity and reliability) of the Turkish version of the mSQUASH is needed before it can be implemented.

Keywords: Outcomes; AxSpA; Physical activity; mSQUASH; Validation

INTRODUCTION

Axial Spondyloarthritis (axSpA) is a chronic rheumatic and musculoskeletal disease characterized by inflammation of the axial skeleton and resulting in back pain, stiffness, and spinal structural changes¹. Consequently, physical limitations caused by restricted spinal mobility and pain result in difficulty performing daily living activities².

To prevent disease progression and to control disease symptoms in patients with axSpA, treatment recommendations consider regular physical activity, in addition to pharmacologic modalities^{3,4}. Moreover, a growing body of evidence indicates that regular physical activity improves both overall and functional status in patients with axSpA⁵⁻⁷.

Physical activity is the terminology used for any movement of the body produced by skeletal muscles and causes caloric expenditure. This is a broader defined entity than exercise alone, which is limited to a subset of physical activity done in a planned and repetitive way to keep the body fit⁸. There are several tools to measure physical activity with distinct measurement properties⁹. Patient-reported outcome measures (PROMs) such as the International Physical Activity Questionnaire (IPAQ) and the Short Questionnaire to Assess Health-enhancing physical activity (SQUASH) are easily applicable in both clinical practice and research settings^{10,11}. Further assessment was done to understand the measurement properties of these tools which showed that the SQUASH was superior to IPAQ especially in test-retest reliability and feasibility with less missing values and is therefore more suitable to assess daily physical activity in axSpA¹². However, patients suggested to add several more disease specific items related to physical activity to make it more appropriate and valid for use in patients with axSpA¹². Following this, a modified version was developed in Dutch based on interviews with axSpA experts and patients, the modified SQUASH (mSQUASH)¹³. In this study, an English version was also provided, though not following a thorough cross-cultural adaptation process¹³. Furthermore, the mSQUASH has been adapted in Spanish and there is an ongoing collaboration to have this tool in different languages¹⁴.

Therefore, this study aimed to perform i) the translation and cross-cultural adaptation of the mSQUASH into Turkish; ii) the testing of conceptual equivalence of the translated version of the mSQUASH for use in Turkish patients with non-radiographic (nr) and radiographic (r) axSpA.

METHODS

A standardised forward and backward procedure was used for the translation and cross-cultural adaptation of mSQUASH into Turkish, consisting of 5 steps using the Beaton method (Figure 1).¹⁵

Forward Translation

Two bilingual translators who are native speakers of Turkish translated the Dutch version of the mSQUASH into Turkish. To provide accurate and acceptable translations from both clinical and colloquial point of view, different background of translators was chosen. One translator was considered informed, meaning the person had a clinical background, and the other was uninformed. The informed translator received information on the purpose of the mSQUASH questionnaire. The uninformed translator was a layman, with no medical background and was not informed on the details of the tool. Translations included the instructions, items, and options to respond. A written report was provided by both translators separately including their translations and uncertain points with their rationale for their final decisions.

Synthesis of translation

The two translations were compared, and the differences were discussed in an online meeting in which the translators and the local research team participated. The two versions were harmonized with adjustments according to the discussions and a final version was reached. A written report was produced stating the points addressed.

Backward translation

Two bilingual translators who are native speakers of Dutch and who were blinded to the original mSQUASH version translated the synthesized version back into Dutch. They were uninformed and unaware of the purpose of the questionnaire and concepts used in the tool. They provided a separate written report of their backward translations.

Expert committee review

Finally, all translations and written reports were reviewed by an expert committee consisting of the four translators, members of the research team and two patients. Discussions focused on the equivalence between both versions: semantic (ensuring that the words had the same meaning and there were no grammatical issues in the translation), idiomatic (formulation of expressions equivalent for colloquialisms), experiential (whether items captured the daily living conditions in the target culture), and conceptual (whether the items had the same conceptual meaning). The committee developed a pre-final mSQUASH in Turkish for field test evaluation, by reaching consensus on discrepancies between all versions of the questionnaires.

Field Test with cognitive debriefing

A representative sample of Turkish axSpA patients with a broad range of age, symptom duration, education level and disease activity, underwent the field test with cognitive debriefing. Patients from the outpatient clinic of the Department of Rheumatology at the Hacettepe University were recruited on a consecutive basis. Patients with axSpA who met the ASAS classification criteria and were able to communicate verbally and written in Turkish were enrolled. Patients with severe co-morbidities (e.g. neurological or psychiatric problems) that would potentially have an impact on the assessment were excluded. Initially, patients completed the pre-final version in a face-to-face interview (cognitive debriefing) with one member research team. We recorded 1) the time taken to complete the questionnaire, 2) whether the instructions had been read by the patient, and 3) the patient's comments on particular items. Each item was assessed for their understandability by the participants. The purpose of the interviews was also to assess the cultural relevance, comprehensiveness and applicability of the whole questionnaire. Data on age, gender, educational level, working status and disease characteristics, including disease activity (Bath Ankylosing Spondylitis Disease Activity Index (BASDAI), Ankylosing Spondylitis Disease Activity Score (ASDAS) with C-reactive protein) and functional disability (Bath Ankylosing Spondylitis Functional Index (BASFI)) were collected. These interviews were also documented by written reports for each participant. The final translation was produced by integrating the pre-final version with the cognitive debriefing reports.

Ethical approval

The study was conducted in accordance with the ethical standards of the 1964 Helsinki Declaration and was approved by the Ethics Committee of Hacettepe University Faculty of Medicine (No. GO 21/822). Informed consent was obtained from all patients included in the study.

RESULTS

The translation and cross-cultural adaptation of the Turkish version of mSQUASH was performed using the original Dutch version. The final version of the Turkish mSQUASH can be found in the supplementary files.

Forward-Backward translations and Expert Committee Review

When comparing the two independent translations using the forward translation method, no major differences were observed. Minor differences were solved in the synthesis meeting and are summarized as follows: In the initial instruction of the questionnaire, the sentence `Toelichting bij de mate van inspanning` was translated either as `Güç miktarının açıklaması` or `Çaba miktarının açıklaması`. The final decision was to include both `Güç` and `Çaba` as being more complimentary when both were used and the final version was set as `Güç/çaba miktarının açıklaması`. The other was the instruction in items 3-4 Ander bestemmingen (heen en terug), which was translated either as `Diğer ulaşım (gidip-gelmek)` or `Diğer hedeflere (gidip gelme)`. This phrase is about going to other places and the concerns raised by using 'transport' or 'destination' as 'ulaşım' or 'hedef'. In order to be culturally adaptable, a consensus was reached to use a word equivalent to 'the destination', which was semantically equivalent to the Dutch version. The final version was set as 'Diğer hedeflere (gidip gelmek)'. Another discussion point was item 12, `Klussen/doe-et-zelven`, which was either translated as `Ufak ev tamiratları yapmak` or `Ufak tadilatlar yapmak`. The decision was again to include both `tamirat` which is more likely used for repairs and `tadilat` is used for renovations. The final version was set as `Ufak ev tamirat / tadilatları yapmak`. The discrepancy arose in repetitively used idiom `Niet van toepassing`. It was translated as `Geçerli değil` by one translator and `Geçersiz` by the other. The final decision was to translate it as `Geçerli değil` and the team agreed on to discuss it and emphasize the initial discrepancy in the expert review. Another discussion was on the item 6 `Hoeveel van die uren zijn zwaar inspannend werk?` This item translated as `Bu saatlerin ne

kadarı ağır iştir?’ and ‘Bu saatlerin ne kadarı yorucu iştir?’ by two translators. The final decision was ‘‘ Bu saatlerin ne kadarı ağır iştir?’. However, a note was taken to discuss the word ‘zwaar’ in English “intensive” in the expert meeting before taking a final decision on the best and most equivalent term. Backward-translations were performed without specific problems.

In the expert committee review meeting, all versions were reviewed, and the discrepancies were discussed. The term ‘Niet van toepassing’, was finally set as ‘Uygun değil’. This was found to be more equivalent between both languages. Another item that was left to be discussed at the previous stage, was item 6 ‘Hoeveel van die uren zijn zwaar inspannend werk?’ which was included as ‘Bu saatlerin ne kadari ağır/zorlayıcı iştir?’. The committee decided to include two translations of ‘zwaar’ to make the sentence more equivalent in terms of experience. The committee agreed that both translators' back translations were in good agreement with the original. The final version was semantically, idiomatically, experientially, and conceptually equivalent and was approved.

Field testing with cognitive debriefing interviews

In the field trial, 10 patients with axSpA who met the ASAS criteria were subjected to a cognitive debriefing interview. Before reaching the number of responses needed to found saturation in responses/comments overall 15 patients were screened. One female patient was excluded as she does not know reading/writing. Moreover, 4 male patients declined our invitation to participate because they need to turn back to work. The results of 10 people were considered saturated with responses and comments. For this reason, the final sample was defined as 10 individuals, consisting of 7 patients with r-axSpA and 3 with nr-axSpA. The mean (SD) age was 37.8 (10.4) years; male (n=3); median (IQR) disease duration was 4 (13.5) years. Demographic and clinical characteristics of the participants are shown in the Table-1. The mean (SD) time for the completion of the questionnaire was 6.1 (2.4) minutes.

All the participants found the instructions and the individual items of the mSQUASH questionnaire to be clear and easy to complete. They reported that there was no item or word that was unclear. They all reported that the items were sufficient for them to assess their daily physical activity. None of the patients felt that any aspect of their disease related to daily physical activity was missing from the final Turkish version of the mSQUASH. No item or word was found to be culturally inappropriate. Saturation in responses/comments was observed

during these 10 interviews as 8 patients had no further comments and there were only 2 patients having the same comment. This was a minor suggestion made by two patients (ID1 and ID7) concerning the last item` instruction ` Sport en beweging B.v. (zoals (fysio) fitness, oefentherapie, hardlopen, tennis, voetbal, zwemmen, dansen)` which was adapted as `Spor ve hareket Örneğın. (fizyo) fitness, hareket / egzersiz terapisi, tenis, futbol, yüzme, dans etme`. Patients suggested that not all sport examples were culturally appropriate. It was suggested to change tennis into volleyball and basketball and the final version was adapted accordingly. No particular comments were received on the time needed to complete the questionnaire.

DISCUSSION

This study successfully provided the translation and cultural adaptation of the Turkish version of the mSQUASH from the original Dutch one. In order to make the Turkish version equivalent in all aspects, minor changes had to be made to the original translation. Modifications mostly included either change or addition of a word to serve comprehensibility. Backward-translations were in good agreement with the original version. The field test interviews showed that the Turkish version of mSQUASH is clear and acceptable for patients. No notable cultural differences were found except in the sports examples which were change accordingly.

The development of the mSQUASH was prompted by the need of patients with axSpA to have disease-specific items included in the SQUASH to assess their daily physical activity.¹² This was accomplished in the mSQUASH¹³. In the field test interviews of the Turkish version of the mSQUASH, patients did not report any aspect of their disease in relation to physical activity missing in this instrument.

mSQUASH has been shown to be a valid, reliable and feasible questionnaire with good sensitivity to change for measuring daily physical activity in people with axSpA.¹³ Moreover, good correlation was found with accelerometer which is a gold standard of physical activity measurement. When the original SQUASH was modified, one of the adaptations was a change in the physical activity intensity at work or school which was originally developed in terms of hours of 'light and average' and/or 'heavy' work. The modified version has two separate questions as 'How many hours per week do you work and/or go to school?' and 'How many of those hours involve physical intensive work?'¹³. Additionally, in our adaptation process the translation and adaptation of "intensive work" was discussed. Decision was made to use two Turkish words for 'intensive' to make the expression equivalent to the meaning of the wording in Dutch, in terms of experience. Another adaptation in the mSQUASH was the addition of

physiotherapy-fitness and exercise as examples to the domain of sports¹³. In the cognitive debriefing interviews in our study, two patients suggested the modification of the domain sports from a cultural background point of view.

The feasibility was comparable in terms of average completion time, which was 6.1 minutes for the translated mSQUASH and 7 minutes for the original version¹³. A limitation of this study which is different from the initial validation study is that we included more females, 70% in our assessment versus 40% in the initial validation study, which is somewhat less representative of the axSpA population¹³. Most of the male patients who declined to participate in our study were young and full-time workers and were not able to spend time on the cognitive debriefing interviews because of their job duties. However, all other patient and disease characteristics were representative of an axSpA population. In the present study, we observed a saturation of responses/comments during these 10 interviews and therefore we believe that the current sample size is adequate. However, not including a larger number of patients in the cognitive debriefing and field test can also be considered a limitation of our study, although the sample size of 10 patients for the cognitive debriefing interviews is in line with the cross-cultural adaptation of several other PROMs in axSpA, e.g. the Assessment of SpondyloArthritis International Society Health Index (ASAS-HI) and Coping with Rheumatic Stressors (CORS) questionnaires, and also the adaptation of mSQUASH to other languages^{14,16, 17, 19}. Some time ago, Cruz et al first adapted the ASAS-Health Index using the same methodology with 10 patients and described the translation and cross-cultural adaptation process¹⁶. They then went on to provide psychometric properties in another manuscript¹⁸. Benavent *et al*, recently demonstrated the cross-cultural adaptation process of CORS into Spanish, using a similar approach to ours and using 10 patients for cognitive debriefing¹⁷. Our research team has also adapted the CORS to Turkish, using exactly the same methodology, which was recently published¹⁹. More recently, the Spanish version of mSQUASH has been published with 10 patients included in the cognitive debriefing¹⁴.

This study represents a first important step in using mSQUASH in Turkey to provide accessible measures of daily physical activity for research and clinical practice in people with axSpA. The administration of the questionnaire is easy. There is no need for additional resources for administration, nor is medical training necessary for the scoring of the questionnaires. The original mSQUASH showed good validity, test-retest reliability and responsiveness in Dutch axSpA patients. As next step, we will investigate the psychometric properties of the Turkish mSQUASH in the context of a collaborative ASAS project.

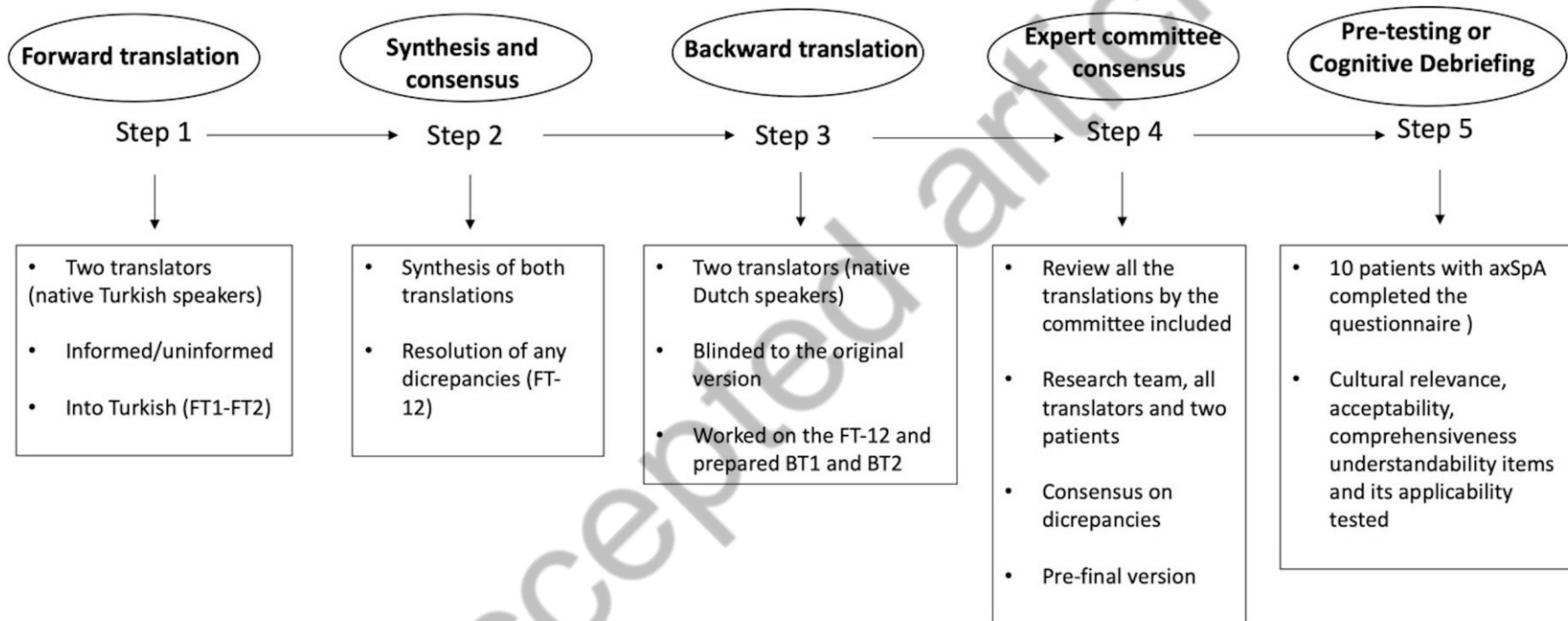
Tables and Figures

Table I. Demographic and clinical characteristics of the patients included in the field testing

Patient-ID	Age	Gender	axSpA subtype	Disease duration, years	Symptom duration, years	Education level	Work status	BASDAI	BASFI	ASDAS-CRP
1	33	F	r-axSpA	2	5	University	Housewife	4.1	2.5	3.4
2	42	F	r-axSpA	13	18	Secondary school	Full-time	1.7	1.7	3.3
3	53	M	r-axSpA	41	42	University	Full-time	3.2	1	2.6
4	49	F	r-axSpA	23	23	Primary school	Housewife	6.2	2.6	3.5
5	25	F	nr-axSpA	5	5	High school	Housewife	5.9	0	2.5
6	26	F	nr-axSpA	2	4	University	Full-time	3.2	2.7	2.3
7	29	F	r-axSpA	10	12	University	Full-time	2.0	1.3	2.0
8	40	M	nr-axSpA	3	10	High school	Homemaker	3.1	6.4	2.4
9	31	F	r-axSpA	0.5	5	High school	Housewife	6.9	5.9	3.7
10	50	M	r-axSpA	3	7	High school	Full-time	9.6	9.5	5.2

F= Female, M=Male, axSpA= Axial Spondyloarthritis, r-AxSpA= radiographic axial spondyloarthritis, nr-AxSpA=Non-radiographic Axial Spondyloarthritis, BASDAI= Bath Ankylosing Spondylitis Disease Activity Index, BASFI= The Bath Ankylosing Spondylitis Functional Index, ASDAS-CRP= Ankylosing Spondylitis Disease Activity Score C-reactive protein

Figure 1 - Flow-chart of the translation and cross-cultural adaptation process



Supplementary material – Turkish mSQUASH

mSQUASH

Sağlığı geliştirici fiziksel aktiviteyi değerlendirmek için modifiye kısa anket

Tarih:

Ad Soyad/ Çalışma no:

Ülke:

AÇIKLAMA - Lütfen başlamadan önce açıklamaları dikkatlice okuyun

Geçen ayın ortalama bir haftasını düşünün. Lütfen aşağıdakileri belirtiniz:

- aşağıda açıklanan aktiviteleri haftada kaç gün gerçekleştirdiğinizi
- her bir aktiviteyi yapmak için geçen ortalama süre
- her bir aktivite için fiziksel olarak ne kadar güç sarf ettiğinizi

ÖRNEK

Eve/işe gidip gelmek	Uygun değil	Ortalama gün sayısı	Günlük ortalama süre	Güç/Çaba
1. İşe veya okula yürüyerek gidip gelmek	<input type="radio"/>	5 gün	0 saat 30 dakika	<input checked="" type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor

Güç/çaba miktarının sınıflandırılması

Yavaş/hafif:	Normal kalp atış hızı ve normal nefes alma düzeni
Orta:	Artan kalp atış hızı ve hızlı nefes alma
Hızlı/zor:	Artan kalp atış hızı, terleme ve hızlı nefes alma

ANKET BAŞLANGICI

Eve/işe gidip gelmek (ücretli/ücretsiz iş veya okul/eğitim)	Uygun değil	Ortalama gün sayısı	Günlük ortalama süre	Güç/Çaba
1. İşe veya okula yürüyerek gidip/gelmek	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
2. İşe veya okula bisiklet ile gidip/gelmek	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
Diğer hedeflere (gidip gelmek) (örn; market, spor salonu ya da birini ziyaret etmek)	Uygun değil	Ortalama gün sayısı	Günlük ortalama süre	Güç/Çaba
3. Diğer hedefe yürüyerek gidip/gelmek	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
4. Diğer hedefe bisiklet ile gidip/gelmek	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
İş (ücretli/ücretsiz) veya okul/eğitim	Uygun değil		Güç/Çaba	
5. Haftada kaç saat çalışıyor ya da okula gidiyorsunuz?	<input type="radio"/>		___ saat	
6. Bu saatlerin ne kadarı ağır/zorlayıcı iştir? (örn; ağır şeyleri düzenli olarak kaldırmak)	<input type="radio"/>		___ saat	

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AÇIKLAMA -

Geçen ayın ortalama bir haftasını düşünün.

Güç/çaba miktarının sınıflandırılması

Yavaş/hafif: Normal kalp atış hızı ve normal nefes alma düzeni

Orta: Artan kalp atış hızı ve hızlı nefes alma

Hızlı/zor: Artan kalp atış hızı, terleme ve hızlı nefes alma

Ev işleri:	Uygun değil	Ortalama gün sayısı	Günlük ortalama süre	Güç/Çaba
7. Hafif ve orta derecede yorucu ev işleri (örn; yemek pişirme, bulaşık yıkama, temizlik)	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
8. Ağır ev işleri (örn; çarşaf değiştirmek, küçük çocuk kaldırmak, banyo temizlemek, ağır torba taşımak)	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
Boş zaman	Uygun değil	Ortalama gün sayısı	Günlük ortalama süre	Güç/Çaba
9. Yürüyüş yapmak	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
10. Bisiklet sürmek	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
11. Bahçe işleri ile ilgilenmek	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
12. Ufak ev tamirat / tadilatları yapmak	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
13. Alışveriş yapmak	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
Spor ve hareket (örn; fizyo) fitness, hareket / egzersiz terapisi, futbol, voleybol, basketbol, koşu, yüzme, dans etme)	Uygun değil	Ortalama gün sayısı	Günlük ortalama süre	Güç/Çaba
14. _____	<input type="radio"/>	___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
15. _____		___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
16. _____		___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor
17. _____		___ gün	___ saat ___ dakika	<input type="radio"/> Yavaş/hafif <input type="radio"/> Orta <input type="radio"/> Hızlı/Zor

Anketin sonu.

Lütfen tüm soruları tamamladığınızdan emin olun.

Katılımınız için çok teşekkür ederiz!

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