$p < 0.01$), and between the 6MWT distance and quality of life ($R = 0.62$, $p < 0.01$), and between DASH and quality of life ($R = -0.48$, $p = 0.03$).

Conclusions: AHSCT enhances the functional status of SSc patients, significantly improving skin involvement, hand function, physical capacity and quality of life. These results can be interpreted as positive outcomes of AHSCT for SSc.

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SAT0727-HPR CRITERION VALIDITY AND RELIABILITY OF A SUBMAXIMAL TREADMILL TEST IN JUVENILE IDIOPATHIC ARTHRITIS PATIENTS

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Background: For both research purposes and daily clinical practice, a feasible exercise test with acceptable measurement properties is needed to measure exercise capacity in juvenile idiopathic arthritis (JIA) patients.

Objectives: To evaluate the criterion-validity, test-retest reliability and inter-rater reliability of an eight-minute submaximal treadmill test, which can be used to estimate VO_{2peak} , in JIA patients.

Methods: 59 patients with oligo- ($n=30$) and polyarticular ($n=29$) JIA (mean age (SD) 13.6 (2.2), 50 girls) participated in this study. They performed a maximal treadmill test until exhaustion to measure the VO_{2peak} directly and the eight-minute submaximal treadmill test to estimate the VO_{2peak} . A standardised formula was used to estimate the VO_{2peak} . To evaluate the reliability, 37 patients also performed the submaximal treadmill test twice on the same day 1–4 weeks after the initial test. Paired t-tests were used to test potential differences between the tests. Criterion validity and reliability were evaluated with two ways mixed interclass correlation coefficient (ICC). Limits of agreement (LoA) (Bland and Altman method), standard error of measurement ($SEM_{agreement}$) and smallest detectable change (SDC_{95}) were calculated to evaluate the measurement error of the submaximal treadmill test.

Results: No significant difference was found between the observed and estimated VO_{2peak} ($mL \cdot kg^{-1} \cdot min^{-1}$), 44.8 (8.8) vs 43.2 (10.3) respectively, $p=0.18$. The single ICC (95% CI) value at individual level between the estimated and measured VO_{2peak} was moderate; ICC 0.55 (0.34–0.70) while the ICC at group level was good; 0.71 (0.51–0.82). The measurement errors were large (SEM 6.5 and SDC_{95} 18.0). The single ICC value for test-retest reliability and interrater reliability were good to excellent, 0.84 (0.71–0.91) and 0.92 (0.83–0.96), respectively. The ICC value at group level for test-retest reliability and interrater reliability were excellent, 0.91 (0.83–0.96) and 0.96 (0.91–0.98), respectively. There were no significant differences between estimated VO_{2peak} ($mL \cdot kg^{-1} \cdot min^{-1}$) when comparing the results from the three performed submaximal treadmill tests. The measurement errors were moderate/large for both test-retest reliability and interrater reliability (table 1). The Bland Altman plots showed no systematic differences, but confirmed the large variability for both the validity and reliability (figure 1).

Table. Reliability and measurement error of the submaximal treadmill test

	Test*	Retest*	Difference*	$SEM_{agreement}$	LoA	SDC_{95}
Est VO_{2peak} ($mL \cdot kg^{-1} \cdot min^{-1}$)	44.9 (9.4)	44.3 (11.0)	0.6 (5.9)	4.1	–11.0–12.0	11.4
	Tester 1*	Tester 2*	Difference*	$SEM_{agreement}$	LoA	SDC_{95}
Est VO_{2peak} ($mL \cdot kg^{-1} \cdot min^{-1}$)	44.3 (11.0)	42.7 (10.5)	1.6 (4.1)	3.1	–6.4–9.7	8.6

*Values are mean (SD).

Abstract SAT0727HPR – Figure 1. Limits of agreement for VO_{2peak} ($mL/kg/min$) for criterion validity (A), test-retest (B) and interrater reliability (C).

Conclusions: The submaximal treadmill test is valid for use in JIA patients on group level, but showed only moderate validity on an individual level. The test-retest and intra-rater reliability is good to excellent; however, the measurement errors are large. Our findings indicate that the submaximal treadmill test is not optimal for use in daily clinical practice to estimate VO_{2peak} in individual patients and it is important to be aware of the large measurement errors.

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SAT0728-HPR EVALUATION OF THE EFFECTIVENESS OF AN EDUCATIONAL PROGRAM IN PATIENTS WITH OSTEOARTHRITIS OF THE KNEES

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Background: Osteoarthritis (OA) is the most common chronic joint disease, affecting about 50% of the population aged 65 or over, its incidence tends to increase according to the age.

Educational intervention is considered an important part of treatments for chronic diseases. However, in the literature, for OA there is still no standard of educational program to be followed.

Objectives: To evaluate the effectiveness of the educational intervention in patients with knee osteoarthritis regarding to pain, function, anxiety and quality of life

Methods: Sixty patients with knee OA, both genders and age between 40 to 80 years, were included. The patients were randomised into 2 groups: Experimental Group (EG) received an educational intervention, composed of 5 consecutive sessions held once a week, with a duration of 60 min each session. At the end of the last class, a booklet was given to each patient with all the content of the classes. In addition to the educational program, this EG also received a TENS (Transcutaneous Nerve Electrical Stimulation) treatment performed twice a week for 5 weeks for 40 min each session. Control group (CG) received the same TENS treatment as EG group.

The evaluations were performed at baseline, 4 and 12 weeks after baseline with the following instruments: numerical pain scale (NPS) for pain; WOMAC questionnaire and 6 min walk test for function; IDATE questionnaire for anxiety and SF-36 questionnaire for quality of life.

Results: Regarding the variables pain, function, anxiety and quality of life, no statistically significant difference was found between groups over time. (table 1) The intragroup comparisons show no improvement in both groups between T0 and T4 and T0 and T12 for: pain; function total and pain score of WOMAC and domains physical role functioning and social role functioning of SF-36 (table 1)

Abstract SAT0728HPR – Table 1. – Intergroup and intragroup comparisons

	Control group n=30			Experimental group n=30			p interaction
	T0	T4	T12	T0	T4	T12	
Numerical pain scale (cm)	6.37±1.39	4.89±1.27*	5.06±1.73*	6.33±1.62	4.76±1.12*	5.56±1.24*	0.377
WOMAC questionnaire							
Total	35.2±15.4	31.9±17.1*	30.8±16.9*	35.6±19.1	30.2±19.6*	32.4±17.60*	0.623
Pain	9.10±3.82	6.47±4.07*	6.60±3.69*	8.30±4.68	5.67±4.46*	6.77±4.14*	0.391
Stiffness	3.53±4.09	2.87±2.13	2.97±2.33	3.27±2.20	3.07±2.12	2.97±1.87	0.79
Physical function	21.7±11.3	22.9±12.9	21.3±13.0	24.1±14.0	21.4±14.2	22.6±13.4	0.438
IDATE questionnaire							
Trace	50.9±18.3	51.8±15.8	51.4±14.5	43.1±14.3	42.7±10.5	45.4±11.7	0.529
State	45.4±11.7	45.5±14.2	47.9±15.6	51.8±13.6	52.7±12.2	51.6±10.7	0.406
SF-36 questionnaire							
Physical functioning	50.0±22.9	48.9±29.1	60.9±25.9	45.7±28.2	53.1±28.9	51.3±25.5	0.12
Physical role functioning	35.7±32.4	44.2±34.5*	52.8±36.4*	36.3±41	52.9±39*	49.7±29.5*	0.529
Bodily pain	44.0±20.7	50.3±21.1	52.7±23.1	31.2±4.5	48.0±25.5	47.4±22.2	0.865
General health perceptions	60.4±24.1	59.1±27.3	65.9±22.7	58.2±2.0	63.7±21.2	59.4±21.2	0.192
Vitality	49.1±23	54.5±24.3	55.2±4.6	51.5±21.2	54.2±4.1	44.7±22.1	0.125
Social role functioning	83.4±25.5	85.1±24.1*	93.3±16*	68.3±31.4	88.3±24.3*	87.10±23.8*	0.052
Emotional role functioning	52.2±50.0	63.3±49.1	72.4±44.7	42.2±47.9	63.3±49.0	46.7±50.7	0.211
Mental health	62.8±26.3	66.5±27.2	66.2±28.8	60.7±26.4	69.1±25.5	62.7±26.7	0.596
6-Minute walking test (meters)	356.9±110.1	376.2±96.0	370.9±105.1	360.1±112.5	389.0±102.8	394.2±116.6	0.464

* = p < 0.05 in the intragroup analysis compared to baseline

Conclusions: This educational intervention was not effective in improving pain, function, anxiety and quality of life in patients with osteoarthritis of the knees.

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SAT0729-HPR FIRST EXPERIENCES WITH ONLINE REMOTE MONITORING IN PATIENTS WITH INFLAMMATORY RHEUMATIC DISEASES

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Background: Inflammatory rheumatic diseases (IRDs) such as Rheumatoid Arthritis (RA) and Psoriatic Arthritis (PsA) are characterised by a fluctuating disease course. Because of these fluctuations, the disease activity in between outpatient visits can be different from the disease activity objectively measured at outpatient visits. In order to capture the in between disease activity and to encourage patients to take an active role in their disease management, iMonitor¹ was developed. This online self-monitoring tool allows patients to complete Patient-Reported Outcome Measures (PROMs) in order to get insight in their disease activity.

Objectives: To gather patient experiences regarding online remote monitoring in IRDs and to provide recommendations in order to efficiently arrange and optimise self-monitoring.

Methods: This mixed-method study was conducted at a teaching hospital (Bernhoven, Uden, the Netherlands) from April 2016 until August 2017. Adult patients with RA or PsA were eligible to participate and were recruited by means of purposive sampling. Four instruction classes were organised in which patients received instructions regarding how to use iMonitor. Patients indicated which PROM(s) they preferred to complete (HAQ, RAID, and/or RADAI-5) and at which frequency (one-, two-, four-, six-, or eight-weeks). The system generated an alert email accordingly, adherence was determined by checking whether the PROM was completed within the time interval. Level of congruence between DAS28-scores and PROM-values (very poor – very good) were independently determined by two researchers (LR and PVR). Facilitators and barriers with regard to using iMonitor were collected by means of a focus group discussion and four telephone interviews.

Results: Seven patients with PsA and 32 with RA participated in this study. Most were female (n=23, 59%). Mean (±SD) age was 56.6 (10.7) years. RAID was chosen most often (29 times). Most patients (n=25) chose a four-week PROM-frequency. Mean adherence was 52.9%, patients with a one-week frequency were most compliant (73.8%). Regarding the congruence between DAS28 and PROMs, RAID scored best. Overall, patients were positive about iMonitor. They felt more aware about their disease and its consequences, felt supported in

handling their disease, and gained more knowledge about their disease (activity). Based on our first experiences, recommendations for optimal self-monitoring are: 1) Patients need to be actively recruited 2) Tailored education (e.g. instruction class) is useful for some patients in order to get familiar with the program. 3) Patients need to get feedback from their healthcare provider regarding their outcomes. 4) Working with a stand-alone system such as iMonitor is not feasible, it should be integrated in an existing (hospital) system.

Conclusions: Self-monitoring is a first step towards personalised healthcare. Patients become more aware about their disease and gain more knowledge about their disease (activity), which can result in increased self-management. Future research should investigate the possibility of skipping outpatient visits for those patients with stable disease activity.

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- [1] iMonitor, developed and funded by Pfizer <http://www.imonitor-med.co.uk>

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SAT0730-HPR DEVELOPMENT OF PSYCHOMETRICALLY EQUIVALENT SHORT FORMS TO MEASURE DISEASE AND TREATMENT ASSOCIATED KNOWLEDGE IN RHEUMATOID ARTHRITIS: APPLICATION OF ITEM RESPONSE THEORY (IRT)

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Background: Patient education can be used to support and enable people with Rheumatoid Arthritis (RA) to optimise health and wellbeing. It has been recommended as an integral part in management of RA in order to undertake self-management activities or to adhere to treatments. Disease-specific knowledge can be measured with a Patient Knowledge Questionnaire (PKQ). Because PKQs in RA are outdated, de Jonge et al. developed the Disease and Treatment Associated Knowledge in Rheumatoid Arthritis (DataK-RA) item bank and provided preliminary evidence to support its construct validity. It was developed with input from patients and rheumatology experts. DataK-RA contains 42 multiple choice items with 2–4 response alternatives per item and was calibrated using the two parameter item response model for dichotomous responses. IRT scores are corrected for item characteristics, which allows scores to be compared between measures that include different items. IRT models also provide detailed information about the precision of scores at different levels of knowledge. Various methods are available that can help select optimal items to be administered to patients, given certain criteria.

Objectives: The objective of this study was to develop two DataK-RA short forms using linear optimal test design.

Methods: The open source excel add in “solver” was used to program a linear optimisation algorithm to develop two short forms. The algorithm was instructed to optimise precision (i.e. reliability) of the scores for both short forms, subject to the constraints that: 1) each item could only be included in one short form 2) each short form should include 15±1 items, 3) reliability for each short form should be >0.70 for all patients who are within 1 SD of the mean of knowledge scores, and 4) scores on each short form should be similarly precise, defined as maximum allowable difference in information of 0.15.

Results: Two short forms were derived from the DataK-RA item bank that satisfied all content constraints. The short forms include respectively 15 and 16 unique items. Reliabilities across different score levels ranged from 0.71–0.80 for both short forms, and the maximum difference in information between the short forms was 0.13.

Conclusions: DataK-RA is a new and promising tool that can be used by healthcare providers to measure disease and treatment related knowledge in patients with RA. The short forms can be used in pre/posttest intervention studies in which disease related knowledge is one of the outcomes. Because each short form includes unique items and IRT scores are adjusted for item characteristics, the application of these short forms will allow users of DataK-RA to avoid learning effects commonly associated with using the same items at two occasions. Furthermore, the equal and high reliabilities of both forms ensure that the observed score distributions for both versions will have similar variances.

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