

Supplementary Table 1: Legacy questionnaires used to assess the construct validity of the IFAB questionnaire

Questionnaires	Description
Modified Health Assessment Questionnaire (mHAQ)	Used to quantify functional status [24]. This subscale contains 8 items regarding daily activity, scored from 0 (“without any difficulty”) to 3 (“unable to do”). The final score range from 0 to 3 (worse functional status) and is calculated by adding all scored items together (at least 6 of the 8 items are required) and dividing by the total number of items answered to obtain the final score.
Fear-Avoidance Beliefs Questionnaires subscale for PA (FABQ-PA)	Used to assess patient's fear avoidance and beliefs about PA [25]. The FABQ-PA is a 4 item questionnaire scored from 0 to 24 where the higher scores indicate the highest degree of fear and avoidance beliefs.
The Tampa Scale for Kinesiophobia (TSK)	Used to assess the subjective rating of kinesiophobia or fear of movement [26]. The TSK is a self-completed 17 item questionnaire and the range of scores is from 17 to 68 where the higher scores indicate an increasing degree of kinesiophobia.
Bath Ankylosing Spondylitis Disease Activity Index (BASDAI)	Used to assess disease activity for patients with axSpA (0-10 with higher score indicating higher disease activity) [27].
Disease Activity Score 28 (DAS28)	Was used to assess disease activity for patients with RA or PsA (0.96-8.47 with higher score indicating higher disease activity) [28]

Supplementary Table 2: References included in the systematic literature review

1. Thomas R, Hewlett S, Swales C, Cramp F. Keeping physically active with rheumatoid arthritis: semi-structured interviews to explore patient perspectives, experiences and strategies. *Physiotherapy* [Internet]. 2018 Sep [cited 2019 Jan 16]; Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0031940618302256>
2. Larkin L, Kennedy N, Fraser A, Gallagher S. 'It might hurt, but still it's good': People with rheumatoid arthritis beliefs and expectations about physical activity interventions. *J Health Psychol*. 2017;22(13):1678–90.
3. Greysen H.M., Greysen S.R., Lee K.A., Hong O.S., Katz P., Leutwyler H. A Qualitative Study Exploring Community Yoga Practice in Adults with Rheumatoid Arthritis. *J Altern Complement Med*. 2017;23(6):487–93.
4. Withall J, Haase AM, Walsh NE, Young A, Cramp F. Physical activity engagement in early rheumatoid arthritis: a qualitative study to inform intervention development. *Physiotherapy*. 2016 Sep;102(3):264–71.
5. Wang M, Donovan-Hall M, Hayward H, Adams J. People's Perceptions and Beliefs about their Ability to Exercise with Rheumatoid Arthritis: A Qualitative Study. *Musculoskeletal Care*. 2015;13(2):112–5.
6. Loeppenthin K, Esbensen B, Ostergaard M, Jennum P, Thomsen T, Midtgaard J. Physical activity maintenance in patients with rheumatoid arthritis: a qualitative study. *Clin Rehabil*. 2014 Mar;28(3):289–99.
7. Law R-J, Breslin A, Oliver EJ, Mawn L, Markland DA, Maddison P, et al. Perceptions of the effects of exercise on joint health in rheumatoid arthritis patients. *Rheumatol Oxf Engl*. 2010 Dec;49(12):2444–51.
8. Crowley L, Kennedy N. Barriers to Exercise in Rheumatoid Arthritis – a Focus Group Study. *Physiother Pract Res*. 2009 Jan 1;30(2):27–33.
9. Swärdh E, Biguet G, Opava CH. Views on Exercise Maintenance: Variations Among Patients With Rheumatoid Arthritis. *Phys Ther*. 2008 Sep 1;88(9):1049–60.
10. Kamwendo K, Askenbom M, Wahlgren C. Physical activity in the life of the patient with rheumatoid arthritis. *Physiother Res Int J Res Clin Phys Ther*. 1999;4(4):278–92.

Supplementary Table 3: Items of barriers and facilitators to physical activity included in the initial version of the IFAB questionnaire

Barriers or facilitators	Facilitators	Barriers
1. Level of symptoms (pain, fatigue, lack of mobility)	7. A belief that physical activity will make symptoms worse	11. Knowledge of benefits of physical activity for health
2. Weather conditions	8. Lack of motivation	12. Knowledge of benefits of physical activity for mood
3. Presence or absence of activity facilities (e.g., green area for walking, gym ...)*	9. Lack of time*	13. External reminders (e.g.: from health professionals, calendars...)*
4. Presence or absence of support from others (friends, family)	10. Lack of knowledge on which exercises to do and how much	14. Confidence on how to exercise safely
5. Presence or absence of support and/or advice from healthcare professionals		
6. Contact and proximity with others during physical activity*		

* Items were deleted from the final IFAB as follows: item 3 (low clinical relevance, low reliability), item 6 (low clinical relevance, low reliability), item 9 (low clinical relevance, low correlation with other questionnaire, low reliability, low correlation with IFAB), item 13 (1 patient misunderstanding).

The reliability of some items was low (ICC <0.5). This can be explained by a change of state of the patient between test and retest or a lack of understanding of the item itself. However, we needed to retain these items since they were clinically important to assess and since the reliability of the whole questionnaire was satisfactory.

Supplementary table 4: Correlation between IFAB and the legacy questionnaires

Items	MHAQ	FABQ	TSK	BASDAI	DAS28	Disease duration	Pain	PGA	Barriers to PA*	Support of PA*
Item 1	-0.50 (0.00)	-0.14 (0.29)	0.25 (0.05)	-0.54 (0.05)	0.00 (0.98)	-0.23 (0.08)	-0.56 (0.00)	0.31 (0.02)	-0.37 (0.00)	0.26 (0.04)
Item 2	-0.13 (0.33)	0.04 (0.77)	0.09 (0.47)	0.15 (0.49)	0.07 (0.68)	0.01 (0.96)	-0.15 (0.25)	0.25 (0.05)	-0.10 (0.42)	0.20 (0.11)
Item 3	0.05 (0.69)	0.13 (0.35)	0.18 (0.16)	0.01 (0.97)	-0.30 (0.09)	0.16 (0.22)	0.17 (0.21)	0.10 (0.48)	0.04 (0.77)	0.33 (0.01)
Item 4	0.21 (0.11)	0.08 (0.53)	-0.06 (0.64)	0.31 (0.12)	0.11 (0.55)	0.22 (0.09)	0.25 (0.05)	-0.06 (0.65)	0.22 (0.08)	0.16 (0.20)
Item 5	-0.43 (0.00)	-0.23 (0.07)	0.28 (0.03)	-0.45 (0.02)	-0.09 (0.63)	-0.29 (0.02)	-0.36 (0.00)	0.07 (0.65)	-0.28 (0.03)	0.04 (0.74)
Item 6	-0.27 (0.05)	-0.08 (0.52)	0.06 (0.66)	-0.45 (0.02)	0.31 (0.08)	-0.33 (0.01)	-0.16 (0.22)	0.09 (0.62)	-0.25 (0.05)	0.03 (0.84)
Item 7	-0.27 (0.03)	-0.14 (0.28)	0.21 (0.11)	-0.01 (0.95)	-0.23 (0.20)	0.01 (0.94)	-0.14 (0.28)	0.14 (0.52)	-0.17 (0.19)	0.11 (0.38)
Item 8	-0.10 (0.45)	0.05 (0.72)	0.20 (0.13)	0.02 (0.91)	0.06 (0.73)	-0.02 (0.87)	0.16 (0.22)	0.07 (0.30)	-0.10 (0.44)	0.27 (0.04)
Item 9	-0.05 (0.70)	0.11 (0.40)	0.08 (0.54)	-0.05 (0.80)	0.08 (0.66)	-0.06 (0.65)	0.13 (0.33)	0.17 (0.30)	-0.18 (0.40)	0.31 (0.02)
Item 10	-0.27 (0.13)	-0.11 (0.40)	-0.03 (0.79)	-0.31 (0.13)	0.22 (0.24)	-0.31 (0.01)	0.02 (0.88)	-0.07 (0.60)	-0.11 (0.39)	0.12 (0.35)
IFAB	-0.24 (0.05)	-0.12 (0.40)	0.19 (0.19)	-0.21 (0.32)	0.12 (0.56)	-0.23 (0.11)	-0.05 (0.71)	0.19 (0.19)	-0.29 (0.04)	0.32 (0.02)

mHAQ: modified Health Assessment Questionnaire; FABQ: Fear and beliefs questionnaire; TSK: Tampa Scale of Kinesiophobia; BASDAI: Bath Ankylosing Spondylitis Disease Activity Index; DAS28: Disease Activity Score 28; PGA: patient global assessment; PA: Physical activity; *global questions related to PA

Supplementary Table 5. Final IFAB and scoring

Please take few moments to think about all the physical activity you did in the previous month: walking, jogging, gardening, other kind of sport... Now, think about all the things that have encouraged you, and all the things that prevented you from doing physical activity in the previous month. This questionnaire has 10 items. It aims to collect all the things that have encouraged you or prevented you from doing physical activity in the previous month.

Please indicate for each item if it has rather encouraged you, prevented you, or had no impact on your physical activity in the previous month (only one answer). If needed, rate the importance.

A: Items that may have encouraged me or prevented me from doing physical activity in the last month.

1. Level of symptoms (pain, fatigue, lack of mobility) <input type="checkbox"/> rather prevented me from doing physical activity in the previous month <input type="checkbox"/> rather encouraged to do physical activity in the previous month <input type="checkbox"/> had no impact on my physical activity in the previous month	Had no impact on my physical activity	0 1 2 3 4 5 6 7 8 9 10	Had a maximal impact on my physical activity
2. Weather conditions <input type="checkbox"/> rather prevented me from doing physical activity in the previous month <input type="checkbox"/> rather encouraged to do physical activity in the previous month <input type="checkbox"/> had no impact on my physical activity in the previous month	Had no impact on my physical activity	0 1 2 3 4 5 6 7 8 9 10	Had a maximal impact on my physical activity
3. Presence or absence of support from others (friends, family) <input type="checkbox"/> rather prevented me from doing physical activity in the previous month <input type="checkbox"/> rather encouraged to do physical activity in the previous month <input type="checkbox"/> had no impact on my physical activity in the previous month	Had no impact on my physical activity	0 1 2 3 4 5 6 7 8 9 10	Had a maximal impact on my physical activity
4. Presence or absence of support and/or advice from healthcare professionals <input type="checkbox"/> rather prevented me from doing physical activity in the previous month <input type="checkbox"/> rather encouraged to do physical activity in the previous month <input type="checkbox"/> had no impact on my physical activity in the previous month	Had no impact on my physical activity	0 1 2 3 4 5 6 7 8 9 10	Had a maximal impact on my physical activity

B: Items that may have prevented me from doing physical activity in the last month.

5. A belief that physical activity will make symptoms worse <input type="checkbox"/> rather prevented me from doing physical activity in the previous month <input type="checkbox"/> had no impact on my physical activity in the previous month	Had no impact on my physical activity	0 1 2 3 4 5 6 7 8 9 10	Had a maximal negative impact on my physical activity
6. Lack of motivation <input type="checkbox"/> rather prevented me from doing physical activity in the previous month <input type="checkbox"/> had no impact on my physical activity in the previous month	Had no impact on my physical activity	0 1 2 3 4 5 6 7 8 9 10	Had a maximal negative impact on my physical activity
7. Lack of knowledge on which exercises to do and how much <input type="checkbox"/> rather prevented me from doing physical activity in the previous month <input type="checkbox"/> had no impact on my physical activity in the previous month	Had no impact on my physical activity	0 1 2 3 4 5 6 7 8 9 10	Had a maximal negative impact on my physical activity

C: Items that may have encouraged me from doing physical activity in the last month.

8. Knowledge of benefits of physical activity for health <input type="checkbox"/> rather encouraged to do physical activity in the previous month <input type="checkbox"/> had no impact on my physical activity in the previous month	Had no impact on my physical activity	0 1 2 3 4 5 6 7 8 9 10	Had a maximal positive impact on my physical activity
9. Knowledge of benefits of physical activity for mood <input type="checkbox"/> rather encouraged to do physical activity in the previous month <input type="checkbox"/> had no impact on my physical activity in the previous month	Had no impact on my physical activity	0 1 2 3 4 5 6 7 8 9 10	Had a maximal positive impact on my physical activity
10. Confidence on how to exercise safely <input type="checkbox"/> rather encouraged to do physical activity in the previous month <input type="checkbox"/> had no impact on my physical activity in the previous month	Had no impact on my physical activity	0 1 2 3 4 5 6 7 8 9 10	Had a maximal positive impact on my physical activity

Items which can be considered as either barriers or facilitators are rated from -10 to 10, items which are barriers only are rated from -10 to 0, and items which are facilitators only are rated from 0 to 10. When an item is not affecting physical activity, score it at 0. If one question is missing impute the item as 0. If two questions are missing, we recommend not calculating the total score.

The global score ranges -70 to 70. Results below -5 might justify a targeted intervention.

This questionnaire is free to use, please cite the paper. (thomas.davergne@gmail.com)

Supplementary Figure 1: Flow of participants in the study

