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ORIGINAL ARTICLE

Adherence to treatment in patients with ankylosing spondylitis

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Abstract This study aims to determine the level of adherence to treatment in ankylosing spondylitis (AS) patients and to identify possible factors associated to lack of adherence. We included consecutive AS patients (NY modified criteria). Sociodemographic and clinical data were collected. Patients answered auto-reported questionnaires: Bath Ankylosing Spondylitis Disease Activity Index, Bath Ankylosing Spondylitis Functional Index, Ankylosing Spondylitis Quality of Life, and Center for Epidemiological Studies Depression scale. Patients with rheumatoid arthritis (RA) (ACR'87 criteria) were assessed as the control group. The adherence of the studied groups to medical treatment and exercises was measured by means of two questionnaires: Compliance Questionnaire on Rheumatology (CQR) and Exercise Attitude Questionnaire-18 (EAQ-18). The study included 59 patients with AS and 53 patients with RA. Of the AS patients, 43 (72.9 %) were male, median age 47 years (interquartile range (IQR) 33–57) and median disease duration of 120 months (IQR 33–57). Of the RA patients, 37 (69.8 %) were female, had a median age of 56 years (IQR 43.5–60) and a median disease duration of 156 months (IQR 96–288). There were no significant differences in the results of the adherence questionnaires between both groups, with a total median of 68.42 for the CQR in both groups and of 40.7 in AS vs. 42.6 in RA for the EAQ. When dichotomizing patients as adherent and non-adherent, taking as good adherence a cut value in the CQR and EAQ higher than 60, adherence to pharmacological treatment was significantly higher in RA vs. AS (92.5 vs. 74.6 %, $p=0.01$) and there were no differences in the EAQ. On the uni- and multivariate analysis, lack of adherence to treatment was not associated to sex, age, disease duration, education, health insurance, depressive status, and disease activity parameters in neither group of patients. AS have an acceptable adherence to pharmacological treatment, although it is lower than RA patients; nonetheless, both groups show a lack of adherence to exercise.

Keywords Adherence to treatment · Ankylosing spondylitis · Monitoring disease

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Introduction

Ankylosing spondylitis (AS) is a chronic inflammatory disease that primarily affects young adult men and is characterized by the involvement of sacroiliac joints, the spine, hips, and to a lesser extent, peripheral joints. The course of AS is generally progressive with the consequent deterioration of functional capacity and disability related to spinal ankylosis and coxofemoral joints' involvement. This disease causes a decrease in quality of life and a high socioeconomic impact for both the patient and society. A proper treatment including education, physical therapy exercises, and drugs is essential to achieve a good control of the disease [1–6].

One of the most important determinants in order to fulfill this treatment is the compliance of the patient. Adherence to pharmacological treatment may be evaluated in several ways; there are direct methods such as the determination of drug

Table 1 Sociodemographic and clinical features of patients with ankylosing spondylitis and rheumatoid arthritis

Variable	Ankylosing spondylitis (n=59)	Rheumatoid arthritis (n=53)
Age (years), median (IQR)	47 (33–57)	56 (43.5–60)
Sex male, *n* (%)	43 (73)	16 (30)
Disease duration (months), median (IQR)	120 (48–216)	156 (96–288)
Education (years), median (IQR)	12 (7–14)	10 (7–12)
Lack of health insurance, *n* (%)	18 (30.5)	15 (28.5)
Unemployment, *n* (%)	23 (39)	21 (39.6)
Co-morbidities, *n* (%)	36 (61)	32 (60.4)
BASDAI (cm)	5 (3.3–7)	–
BASFI (cm)	5.1 (2.1–7.3)	–
CES-D, median (IQR)	14 (7–23)	–
DAS28, median (IQR)	–	2.9 (2.4–3.5)
HAQ-A, median (IQR)	–	0.38 (0–1)

BASDAI Bath Ankylosing Spondylitis Disease Activity Index, *BASFI* Bath Ankylosing Spondylitis Functional Index, *DAS-28* Disease activity score 28 joints, *HAQ-A* Argentine version for Health Assessment Questionnaire, *CES-D* Center for Epidemiological Studies Depression Scale, *IQR* Interquartile range

blood levels and the measurement of biological markers in serum or urine, and indirect methods such as the assessment of clinical response, pill count, and specific questionnaires [7]. To our knowledge, there is only one questionnaire validated on Rheumatology, the "Compliance Questionnaire on Rheumatology (CQR)," which measures the adherence to treatment regimens and identifies factors that determine a suboptimal adherence. Such questionnaire has been validated in a study performed in patients with rheumatoid arthritis, polymyalgia, and gout, where it was compared with a medication electronic monitoring system, showing a sensitivity and specificity of 98 and 67 % to detect good adherence to treatment [8].

Some studies in AS patients determine their adherence to exercise programs, but in no case the evaluation of adherence was the main objective, and its evaluation had not been sufficiently standardized [9, 10]. In order to evaluate the adherence to physical therapy and exercises, a specific questionnaire has been developed, the "Exercise Attitude Questionnaire EAQ-18," which consists of 18 items and has had a very good acceptance by both patients and experts [11].

Until the present, to our knowledge, there are only two studies that evaluate adherence to medical treatment in AS patients [12, 13] and there are few reports about adherence to physical therapy and/or to an exercise program; such adherence is inferred from the fulfillment of the prescribed plans. For that reason, the objective of our study was to determine the level of adherence to treatment in AS patients and to identify possible factors associated to lack of adherence.

Material and methods

The study included consecutive AS patients according to the New York-modified criteria [14], which attended ambulatory care in a specialized clinic who works on Thursday noon, during the year 2010. Sociodemographic data (age, sex, education, occupation) were collected. Disease activity in AS patients, functional capacity, quality of life, and depression were assessed by Bath Ankylosing Spondylitis Disease Activity Index, Bath Ankylosing Spondylitis Functional Index, Ankylosing Spondylitis Quality of Life, and Center for Epidemiological Studies Depression scale questionnaires, respectively. All of them were culturally adapted and validated in our country [15, 16]. Treatment received was also collected. As a control group, non-selected patients with rheumatoid arthritis (RA) (ACR'87 criteria [17]) from our outpatient clinic were assessed. In RA patient, disease activity was evaluated by Disease Activity Index 28 composite index and functional capacity by Health Assessment Questionnaire-Argentina version [18].

The adherence of the studied groups to medical treatment and exercises was measured by means of two questionnaires: CQR, which measures adherence to pharmacological treatment, and EAQ-18, which measures adherence to exercise. Both questionnaires were previously translated into Spanish by two bilingual physicians and a non-physician person retranslated them into English, demonstrating that they maintained the original features (back translation). The CQR (Appendix 1)

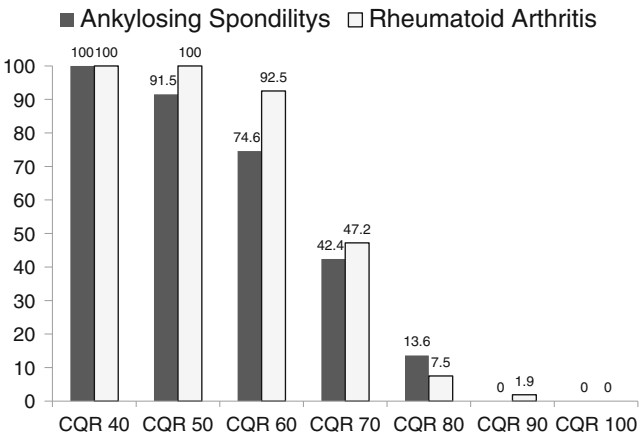

Fig. 1 Proportion of adherent ankylosing spondylitis and rheumatoid arthritis patients, measured by Compliance Questionnaire on Rheumatology (CQR)

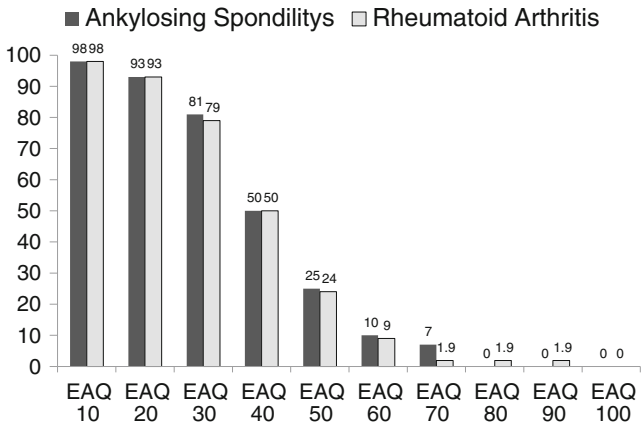

Fig. 2 Proportion of adherent ankylosing spondylitis and rheumatoid arthritis patients, measured by Exercise Attitude Questionnaire (EAQ-18)

consists of 19 items, in which patients have to indicate their level of agreement for certain statements through a Likert scale of four points (strongly disagree, 1 point; somewhat disagree, 2 points; somewhat agree, 3 points; strongly agree, 4 points). Six items present negative statements (no. 4, no. 8, no. 9, no. 11, no. 12, and no. 19); consequently, the score should be reversed (4=1, 3=2, 2=3, 1=4). The final score is calculated adding up all items, subtracting 19, and then dividing it by 0.57 in order to take it to a 0–1 scale. With this, an adherence scale that can vary from 0 (no adherence) to 100 (perfect adherence) may be obtained when multiplying it by 100 [8].

The EAQ-18 (Appendix 2) consists of 18 items and answers are scored through Likert scale of four points (strongly disagree, 1 point; somewhat disagree, 2 points; somewhat agree, 3 points; strongly agree, 4 points). Likewise, the score is reverted for negative statements (no. 1, no. 2, no. 3, no. 4, no. 8, no. 9, no. 11, no. 12, no. 13, no. 14, no. 15, no. 16). The final score is calculated adding up all items, subtracting 18, and then dividing it by 0.54 in order to take it to a 0–1 scale; finally, it is multiplied by 100, obtaining a final range from 0 to 100 [11]. CQR and EAQ reproducibility was evaluated in ten patients (five RA and five AS) who completed the questionnaires with 1 week difference and was evaluated by the intraclass correlation coefficient.

For the *statistical analysis*, a descriptive analysis was performed. Continuous variables were expressed in median and interquartile range (IQR) and compared by Student's *t* test and categorical variables were compared by X^2 or Fisher's exact test. Those variables that in the univariate analysis reached a significance level of <0.1 were included in two multiple linear regression models taking the absolute values of the CQR and the EAQ-18 as dependent variables. Sociodemographic and clinical variables were used as independent variables. In both models, we checked for multicollinearity by the variance inflate factor.

Results

The study included 59 patients with AS and 53 patients with RA. Of the AS patients, 43 (72.9 %) were male, had a median age of 47 years (IQR 33–57) and a median disease duration of 120 months (IQR 33–57). Of the RA patients, 37 (69.8 %) were female, had a median age of 56 years (IQR 43.5–60) and median disease duration of 156 months (IQR 96–288). Features of patients are described in Table 1. Treatments received for AS and RA included: non-steroid anti-inflammatory drugs (NSAIDs), 80 %/68 %; low dose oral steroids, 12 %/51 %; disease-modifying anti-rheumatic drugs (DMARDs), 8.5 %/91 %; and tumor necrosis factor-alpha antagonists, 35.6 %/31 %, respectively.

There were no significant differences in the results of the adherence questionnaires between both groups, CQR median values were 68.42 (IQR 59.6-75.4) for AS patients and 68.42 (IQR 63.15–74.56) for RA patients, and EAQ median values were 40.7 (IQR 5.6–77.8) in AS vs. 42.6 (IQR 5.6–90.7) in RA.

Figures 1 and 2 plot the proportion of AS and RA patients with different scores in CQR and EAQ-18.

When dichotomizing patients as adherent and non-adherent, taking as good adherence a cut off value in the CQR and EAQ higher than 60, adherence to pharmacological treatment was significantly higher in RA vs. AS (92.5

Table 2 Comparison between adherent and non-adherent ankylosing spondylitis patients

	CQR		EAQ	
	Adherent (n=15)	Non-adherent (n=44)	Adherent (n=53)	Non-adherent (n=6)
Age (years±SD)	39.6±12	47.2±15	45±14	48.5±15
Disease duration (months±SD)	129±5	161±2	156±133	131±128
Education (years±SD)	12.4±4	11±4	11.6±4.2	9.5±4.2
Health insurance (% yes)	53.3 %	72.7 %	68 %	67 %
BASDAI (mean±SD)	4.6±3	4.9±3	4.9±2.4	5.6±3.4
BASFI (mean±SD)	4±3	5±3	4.7±2.9	4.2±3.2
CES-D (mean±SD)	11.7±10	17.3±11	15.6±18	18.5±5

p value for all comparisons=not significant

CQR Compliance Questionnaire Rheumatology, *EAQ* Exercise Attitude−18 Questionnaire, *BASDAI* Bath Ankylosing Spondylitis Disease Activity Index, *BASFI* Bath Ankylosing Spondylitis Functional Index, *CES-D* Center for Epidemiological Studies Depression Scale

Table 3 CQR and EAQ scores in patients receiving and not receiving biologic treatment

Ankylosing spondylitis patients			
	Receiving biologics, *N*=21	Non-receiving biologics, *N*=38	*p* value
CQR median (IQR)	68.42 (59.6–73.6)	66.6 (60.9–77.6)	0.87
EAQ median (IQR)	40.7 (25–49)	39.8 (31.4–50.4)	0.85
Rheumatoid arthritis patients			
	Receiving biologics, *N*=16	Non-receiving biologics, *N*=37	*p* value
CQR median (IQR)	71.05 (64–73.7)	67.5 (63.1–75.4)	0.44
EAQ median (IQR)	45.3 (34.7–51.4)	37 (30–48)	0.28

CQR Compliance Questionnaire Rheumatology, *EAQ* Exercise Attitude-18 Questionnaire, *IQR* interquartile range

vs. 74.6 %, $p=0.01$) and there were no differences in the EAQ. On the uni- and multivariate analysis, non-adherent AS patients for CQR were older, had longer disease duration, and had worse depression scores; however, this differences did not reach statistical significance. EAQ scores were almost similar in adherent and non-adherent patients (Table 2).

We look at the adherence scores for patients receiving biologic treatment in both groups (almost 100 % on anti-TNF treatment) compared to patients not receiving these medications. CQR and EAQ scores were higher in patients receiving anti-TNF treatment; however, differences did not reach statistical significance (Table 3).

Discussion

Poor adherence to chronic treatment regimens is very common, contributing to a considerable worsening of the disease and an increase in health care expenditures. Physicians should take into account this factor and improve it by educating the patient, making treatment as simple as possible, and adapting such treatment to the everyday life of the patient [17]. In rheumatic diseases, most compliance studies have been performed in RA [19–22].

To our knowledge, this is the first study that evaluated compliance with pharmacological treatment in AS, using a self-administered questionnaire that evaluates adherence to pharmacological treatment, such as the CQR. No differences were found in the results between AS and RA patients considering absolute values. When dichotomizing the groups as patients adherent and non-adherent to treatment, we detected that RA patients had a significantly higher adherence to pharmacological treatment than those with AS. This could be due the broad therapeutic availability and proven effectiveness in RA, contrary to AS, where pharmacological resources were limited until the arrival of anti-TNF therapies. This data are in accordance with the literature, where previous studies indicate that 60–80 % of patient with RA comply with the treatment [19–22]. A study was performed in 228 RA patients, which the CQR was used to measure adherence to treatment with DMARDs, adherence was of 68 % and it was found that the lack of adherence was associated to a longer disease duration, higher number of perceived adverse events, and belief about the necessity of treatment [19].

Regarding exercises and physical therapy, although there are some works that compare different therapeutic modalities [23–26], to our knowledge, there are no reports that assess patients' adherence to a physical therapy program with a specific self-questionnaire. Constant physical exercise has shown to be very effective in AS patients. To assess adherence, we chose a self-questionnaire that was easy for our patients to understand and answer, showing a good reproducibility. However we did not discriminate among different types of exercises.

Unfortunately, there is no gold standard for evaluating adherence, and results may vary regarding the instrument that is used to measure such evaluation. Self-questionnaires have the advantage of being a simple, cheap, and fast method; yet, they have the disadvantage of being easy to manipulate by the patient.

This study has some limitations, such as the low number of patients included and the absence of a gold standard for the classification of adherent and non-adherent, which could lead to a possible overestimation of this classification. We consider important to clarify that the response of patients referred to its adherence to medication in general, and we do not discriminate between NSAIDs, DMARDs, and biologics, and no evaluation was performed regarding adverse events. However CQR's questions refer to the feeling of the patient on the importance of medication for their welfare, irrespective of the medication they receive.

The lack of adherence is a major problem in chronic diseases, and there is a need of developing effective strategies in order to improve it. According to our study, patients with AS have an acceptable adherence to pharmacological treatment, although it is lower than RA patients; nonetheless, both groups show a lack of adherence to exercise. Future studies will be necessary in order to determine reasons related to the lack of adherence.

Disclosures None.

Appendix 1

Appendix 1 (English version)

Name:…… Date:……..

The Compliance Questionnaire Rheumatology

Please indicate for each statement how far you agree, by placing a cross in the statement that reflects your opinion best

1. If the rheumatologist tells me to take the medicines, I do so.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

2. I take my anti-rheumatic medicines because I then have fewer problems.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

3. I definitely don't dare to miss my anti-rheumatic medications.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

4. If I can help myself with alternative therapies, I prefer that to what my rheumatologist prescribes.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

5. My medicines are always stored in the same place, and that's why I don't forget them.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

6. I take my medicines because I have complete confidence in my rheumatologist.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

7. The most important reason to take my anti-rheumatic medicines is that I can still do what I want to do.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

8. I don't like to take medicines. If I can do without them, I will.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

9. When I am on vacation, it sometimes happens that I don't take my medicines.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

10. I take my anti-rheumatic drugs, for otherwise what's the point of consulting a rheumatologist?
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

11. I don't expect miracles from my anti-rheumatic medicines.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

12. If you can't stand the medicines you might say: "throw it away, no matter what".
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

13. If I don't take my anti-rheumatic medicines regularly, the inflammation returns.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

14. If I don't take my anti-rheumatic medicines, my body warns me.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

15. My health goes above everything else and if I have to take medicines to keep well, I will.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

16. I use a dose organizer for my medications.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

17. What the doctor tells me, I hang on to.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

18. If I don't take my anti-rheumatic medicines, I have more complaints.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

19. It happens every now and then, I go out for the weekend and then I don't take my medicines.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

Appendix 1 (Spanish version)

Nombre y apellido:……Fecha:……..

Cuestionario de Adherencia en Reumatología

Por favor, indique para cada afirmación si usted está de acuerdo o no, haciendo una cruz donde crea más adecuado.

1. Si mi reumatólogo me dice que tome los remedios, lo hago.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

2. Tomo mis remedios porque así tengo menos problemas.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

3. Definitivamente no me atrevo a olvidarme de tomar mis remedios.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

4. Prefiero tomar medicaciones alternativas antes que tomar las que me da el reumatólogo.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

5. Guardo mis remedios siempre en el mismo lugar, por eso nunca me olvido de tomarlos.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

6. Tomo mis remedios porque tengo mucha confianza en mi reumatólogo.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

7. La razón más importante por la que tomo mis remedios es porque de esa manera puedo hacer todo lo que quiero.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

8. No me gusta tomar remedios. Si puedo no los tomo.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

9. Cuando me voy de vacaciones muchas veces no tomo mis remedios.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

10. Yo tomo mis remedios, porque de lo contrario, ¿para qué consulté a un reumatólogo?
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

11. No espero milagros de mis remedios para el reuma.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

12. Si no toleras los remedios, lo mejor es "tíralos a la basura".
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

13. Si no tomo mis remedios regularmente, la inflamación vuelve.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

14. Si dejo de tomar mis remedios, mi cuerpo me lo hace saber.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

15. Mi salud es lo más importante, y si debo tomar mis remedios para estar bien, lo haré.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

16. Uso un organizador de remedios para acordarme de tomarlos
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

17. Lo que mi médico me dice yo lo hago.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

18. Si no tomo mis remedios tengo más complicaciones.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

19. De vez en cuando, cuando salgo los fines de semana no tomo mis remedios.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

Appendix 2

Appendix 2 (English version)

Name:…….. Date:……..

Exercise Attitude -18 Questionnaire

Please indicate for each statement how far you agree, by placing a cross in the statement that reflects your opinion best

1. I feel that my regular work is an adequate substitute to exercise.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

2. I need someone to keep prompting me to do my exercises.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

3. I use mild pain or fatigue as excuses to keep away from my exercises.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

4. I feel exercises take away most of my energy, as I am already feeling weak and exhausted.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

5. I will continue my exercises till I improve, regardless of however long it takes.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

6. I believe that I will definitely improve with exercises as I have seen others improving.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

7. I look forward to doing my exercises each day.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

8. I feel that age is an influencing factor in motivating me to do my exercises.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

9. I feel embarrassed doing exercises in front of others.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

10. Even without company I do my exercises regularly.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

11. I feel that I have no time of my own and my daily exercises take away my valuable time.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

12. I give up on exercises owing to the difficulty in sticking to a schedule.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

13. I would rather suffer with my problems than do exercises.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

14. I do my exercises to satisfy my family.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

15. I feel that my therapist is making tall claims, when he explains to me about the benefits of the exercise program.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

16. I thought of asking my doctor, if there are any medicines available, which will make me better, without doing exercises.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

17. I keep asking my therapist as to how perfectly I have learnt the exercises or how better I could do it.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

18. I am prompt in doing my exercises regularly as it keeps me alert and energetic throughout the day.
Don't agree at all ( ) Don't agree ( ) Agree ( ) Agree very much ( )

Appendix 2 (Spanish version)

Nombre y apellido:……Fecha:……..

Cuestionario de actitud frente al ejercicio-18 (EAQ-18)

Por favor, indique para cada afirmación si usted está de acuerdo o no, haciendo una cruz donde crea más adecuado.

1. Siento que mi trabajo habitual es lo mismo que hacer ejercicios.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

2. Necesito que alguien esté conmigo para hacer los ejercicios.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

3. El dolor leve o la fatiga son una excusa para no hacer mis ejercicios.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

4. Siento que los ejercicios me sacan energía y me siento cansado.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

5. Yo hago mis ejercicios hasta que mejoro, independientemente del tiempo que me tome hacerlos.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

6. Definitivamente pienso que los ejercicios me mejoran y lo mismo veo en otras personas.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

7. Espero poder hacer mis ejercicios todos los días.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

8. Pienso que mi edad es un factor que afecta mi motivación para hacer los ejercicios.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

9. Me da vergüenza hacer ejercicios con otras personas.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

10. Aún cuando estoy solo, hago mis ejercicios regularmente.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

11. Pienso que los ejercicios me sacan tiempo.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

12. Abandono los ejercicios porque me resulta difícil adecuarme a un horario.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

13. Prefiero sufrir con mi enfermedad antes que hacer los ejercicios.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

14. Hago mis ejercicios para complacer a mi familia.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

15. Siento que mi terapista o kinesiólogo exagera cuando me explica acerca de los beneficios del programa de ejercicios.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

16. Pensé en preguntarle al médico si existe algún remedio que me haga sentir mejor sin la necesidad de hacer los ejercicios.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

17. Continuamente le pregunto a mi kinesiólogo como estoy haciendo los ejercicios y si puedo mejorar.
Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

18. Siempre trato de hacer mis ejercicios ya que me da energía para el resto del día.

Nada de acuerdo ( ) Poco de acuerdo ( ) Algo de acuerdo ( ) Absolutamente de acuerdo ( )

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