



Sociedad Española
de Reumatología -
Colegio Mexicano
de Reumatología

Reumatología Clínica

www.reumatologiaclinica.org



Original Article

Tele-Rheumatology during the COVID-19 pandemic[☆]

Jesús Tornero-Molina,^{a,b,*} Fernando Sánchez-Alonso,^c Manuel Fernández-Prada,^a
María-Luisa Bris-Ochaita,^a Alberto Sifuentes-Giraldo,^a Javier Vidal-Fuentes^a

^a Servicio de Reumatología, Hospital Universitario General de Guadalajara, Guadalajara, Spain

^b Departamento de Medicina y Especialidades Médicas, Universidad de Alcalá de Henares, Madrid, Spain

^c Unidad de Investigación de la Sociedad Española de Reumatología, Madrid, Spain



ARTICLE INFO

Article history:

Received 27 August 2020

Accepted 15 October 2020

Available online 2 June 2021

Keywords:

Telemedicine

Rheumatology teleconference

Rheumatic disease

COVID-19

ABSTRACT

Introduction: During the Covid-19 pandemic strategies to prevent transmission of the viral infection obliged our hospital to promote virtual consultations.

Objective: The objective of this study is to describe the results obtained with the previous strategy of transferring activity to teleconsultation during the period of maximum impact of the pandemic.

Material and methods: Between 16/03 and 10/05/2020 all successive consultations in our unit were performed in virtual rheumatology teleconference (RTC) format. The socio-demographic, geo-functional and clinical characteristics of all patients were collected; a numeric verbal scale (NVS) (where 0 = very dissatisfied to 10 = fully satisfied) was applied to assess the degree of satisfaction of the doctor/patient with the RTC.

Results: 469 TC were included. Most patients seen by RTC were women, mean age: 60,83 years. Only 16% had university education. The mean distance travelled for face-to face consultation is 33 Km with a mean total time of 2 h. Most individuals were diagnosed with osteoarthritis/soft tissue rheumatic diseases and/or osteoporosis; 21% had rheumatoid arthritis. The mean length of the TC was 9.64 min. We find more patient satisfaction with the TC when their level of education is higher (OR = 4.12); doctor satisfaction was higher when the individual was better able to manage the Internet (OR = 3.01).

Conclusion: It is possible to transfer rheumatological care activity to TC with a considerable degree of satisfaction for both the patient and the doctor.

© 2020 Elsevier España, S.L.U. and Sociedad Española de Reumatología y Colegio Mexicano de Reumatología. All rights reserved.

Telerreumatología en tiempos de crisis durante la pandemia por COVID-19

RESUMEN

Introducción: Durante la pandemia por Covid 19 las necesidades de prevención de transmisión de la infección viral nos obligaron a potenciar las consultas virtuales.

Objetivo: El objetivo de estudio es describir los resultados obtenidos con la anterior estrategia y definir el perfil de paciente más idóneo para aplicarla.

Material y métodos: Durante el período comprendido entre el 16/3 y el 10/05/2020 todas las consultas sucesivas de nuestro servicio fueron realizadas en formato de teleconsulta reumatológica (TCR). Se recogieron las características sociodemográficas, geofuncionales y clínicas de los pacientes; se evaluó mediante escala numérica verbal (ENV) (0–10, donde 0 = muy insatisfecho hasta 10 = completamente satisfecho) el grado de satisfacción del paciente/médico con la TC.

Resultados: La mayoría de los pacientes atendidos en las 469 TCR realizadas fueron mujeres, con una edad media de 60,83 años. Sólo el 16% habían realizado estudios universitarios. La distancia media recorrida para acudir a una consulta presencial era de 33 km, con una inversión de tiempo total promedio

Palabras clave:

Telemedicina

Teleconsulta reumatológica

Enfermedad reumática

COVID-19

[☆] Please cite this article as: Tornero-Molina J, Sánchez-Alonso F, Fernández-Prada M, Bris-Ochaita M-L, Sifuentes-Giraldo A, Vidal-Fuentes J. Telerreumatología en tiempos de crisis durante la pandemia por COVID-19. Reumatol Clin. 2022;18:157–163.

* Corresponding author.

E-mail address: jtorneromolina@ser.es (J. Tornero-Molina).

de 2 horas. La mayoría de los sujetos estaban diagnosticados de artrosis/reumatismos de partes blandas y/o osteoporosis; el 21% eran portadores de artritis reumatoide. La duración media de la TCR fue de 9,64 min. Encontramos una mayor satisfacción con la TCR por parte del paciente, cuando el nivel de estudios era más alto (OR = 4,33), y por parte del médico cuando el individuo manejaba mejor internet (OR = 3,22). **Conclusión:** Es posible transferir actividad asistencial reumatológica hacia la TCR con un grado importante de satisfacción para el paciente y el médico.

© 2020 Elsevier España, S.L.U. and Sociedad Española de Reumatología y Colegio Mexicano de Reumatología. Todos los derechos reservados.

Introduction

Rheumatic diseases (33.6%) together with lower back pain (23.9%) are amongst the most common causes of consultation.¹ However, access to medical care is not always easy for this type of patient. Physical disability in many of them, distance and difficulty in obtaining face-to-face access to specialists (especially for those living in rural areas), may delay diagnosis and treatment, causing irreversible joint damage.^{2,3}

Teleconsultation (TC) is understood as the use of communication technologies to provide health services to the general population.⁴ Nowadays, the development of TC should allow for a reduction in the number of face-to-face consultations (without undermining the quality of care) to the benefit of the rheumatic patient, who often complains of difficulty in travelling.^{5–7} Synchronised TC methods mean that communication in real time may be effectively made between places which are spatially distant, without the need for the physical presence of the patient. These include telephone consultation and video conferencing systems. During the last 10 years, thanks to technological improvements and the increase in the speed of data transmission, a notable increase of TC has occurred, including tele-rheumatology (TR).^{8,9} However, very few studies have been published on the usefulness and effectiveness of the latter.¹⁰

During the initial wave of the COVID-19 pandemic, care needs and epidemiological strategies for prevention of viral infection transmission forced us to increase virtual consultations as part of successive consultations in our service. The aim of this study is to describe the results obtained from the previously described strategy of transferring face-to-face activity with rheumatology teleconsultation (RTC) during the period of maximum epidemic impact.

Material and methods

The hypothesis of our study was that, faced with the situation of a health crisis triggered by the pandemic, and in order to maintain the attention and care of the patients, it was possible to establish an RTC procedure to guarantee care quality, identifying an especially appropriate patient profile to apply this medical care system to.

During the period between 16th March and 10th May 2020 (total period of lockdown and phase 0 of de-escalation of the state of emergency due to the COVID-19 pandemic in Spain), all successive consultations from our service were transferred to the teleconsultation format. Videoconsultations were not made. The population served was 257,762 inhabitants, 50.5% men and 49.5% women; 16% of them were over 65 years of age (INE 2019).

An observational, descriptive, longitudinal, retrospective study was conducted, covering the RTCs made during the before-mentioned period. The study protocol was approved by the CEIM of our health area (Ref. CEIM: 2020.25.PR). Eligible patients had to meet with the following inclusion criteria: *a*) individuals who had an appointment for consultation in the rheumatology department during the study period and *b*) patients attended during this period in RTC format. The following exclusion criteria were established: *a*) individuals who the doctor considered were not apt for

the RTC procedure, due to the absence of necessary care information; *b*) subjects who could not be located and *c*) individuals with inadequate mental skills to reliably cope with RTC.

The sociodemographic characteristics of all patients were recorded, including their educational level and the level of skill they had in managing information and communication technologies. Within the geo-functional parameters we collected information on the following aspects: *a*) place and environment of residence (urban/rural); *b*) type of transport used to attend consultation (private/public); *c*) distance covered (km) and average time invested (h) to attend a regular face-to-face visit; *d*) presence or non presence of disability, and *e*) need or non need for a caregiver to accompany them for consultation.

All the RTC included were for successive visits. The care information obtained included: *a*) type of consultation: delivery of results after 1st face-to-face visit verified prior to the initiation of the study or the check-up visit (clinical/analytical/other complementary control/therapeutic sequence adjustment); *b*) follow-up time of the patient in rheumatology consultation (years); *c*) number of check-ups per year; *d*) time (months) passed from most recent consultation; *e*) time (min) of duration of the RTC. The clinical characteristics of each subject were also collected: *a*) main rheumatological diagnosis; *b*) other rheumatological diagnoses; *c*) tests requested in the RTC; *d*) therapeutic information: normal rheumatological treatments, changes to treatment (type of route, dose or change of drug), control of biological therapy and *d*) outstanding comorbidities: diabetes mellitus, arterial hypertension, dyslipidaemia, peptic ulcer, depression, anxiety, i stroke, ischaemic cardiopathy.

The level of patient/doctor satisfaction with RTC was evaluated using the verbal numerical scale (between 0–10, where 0 = highly dissatisfied up to 10 = fully satisfied). We also asked the patient about the usefulness of RTC compared with the regular consultation and the patient and doctor on whether they would repeat this format of non face-to-face medical attention.

Within the statistical analysis, a bivariate analysis of mean comparison was performed, with the Student's *t*-test to contrast the measurement of the doctor and patient scores for the different variables. A comparison study of frequencies was also made using contingency tables with the Chi-squared test, to analyse the association of sociodemographic, geo-functional and clinical variables with the use of RTC and the repetition of this, according to doctor and patient opinions. This same focus was repeated with the scores of the doctor and patient dichotomizing these variables. Finally, the effect size measurement was calculated in the doctor and patient scores, evaluating the odds ratio (OR) using logistic regression multivariate analysis. The analyses were performed with the STATA 13.1 (College Station, TX, U.S.A.) programme.

Results

Data was obtained from 469 RTC made in 28 sessions. **Tables 1 and 2** show the main descriptive results obtained in this study. As may be observed, most patients are women, with a mean age of approximately 61 years and a low educational level (only 16% had a university level of education). 51% of the subjects felt

Table 1
Sociodemographic and geo-functional characteristics.

Variable	Value
Age (years); mean (SD)	60.83 (19.8)
Sex, n (%)	Woman = 326 (70) Man = 141 (30)
Civil status, n (%)	Married = 363 (78) Single = 57 (12) Widow = 47 (10) Divorced = 2 (0)
Place of residence, n (%)	Urban = 278 (59.5) Rural = 189 (40.5)
Educational level, n (%)	Primary = 246 (53) Secondary = 146 (31) University = 77 (16)
Skilled in management of new information and communication technologies (ICTs). Yes, n (%)	240 (51)
Disability, n (%)	78 (17)
Means of transport used to go to face-to-face consultation, n (%)	Own car = 348 (74.5) Public transport = 119 (74.5%)
Distance (km) covered to go to face-to-face consultation, mean (range)	33.06 (1–364)
Time (h) invested in face-to-face consultation, mean	2.07
Need caregiver to go to face-to-face consultation, n (%)	93 (19.8)

Table 2
Care and clinical characteristics.

Variable	Value
Type of consultation, n (%)	Results of 1st visit = 49 (11) Successive consultations = 418 (89)
Type of review, n ^a	Clinical assessment = 354 Delivery of results = 338 Adjustment to treatment = 38
Years of follow-up in rheumatology, mean (SD)	8.03 (2.5)
Number of visits per year, mean (SD)	2 (3.5)
Time (months) from last review, media (SD)	6.19 (3.5)
Rheumatic disease attended, n ^b	OA/STR = 199 OP = 141 RA = 99 PsA = 37 AS = 56 FM = 37 Gout = 20 SLE = 17 Col = 27 RPM = 15 ACPD = 5
Biologic therapy control, n (%)	98 (21)
No changes in treatment in RTC, n (%)	379 (81)
Duration of the RTC (minutes), mean (range)	9.64 (3–30)
Satisfaction with RTC NVS patient: mean (SD)	8.62 (4)
Satisfaction with RTC NVS doctor: mean (SD)	8.84 (.5)
Would they repeat RTC? Patient, yes, n (%)	391 (84)
Would they repeat RTC? Doctor, yes, n (%)	431 (92)

ACPD: Arthropathy from calcium pyrophosphate deposit; AS: Ankylosing Spondylitis, Col: Other collagenosis not SLE; FM: Fibromyalgia; OA/STR: Osteoarthritis/Soft tissue rheumatism; OP: Osteoporosis; PMR: Rheumatic Polymyalgia; PsA: Psoriatic Arthritis; RA: Rheumatoid Arthritis; RTC: Rheumatology Teleconference; SLE: Systemic Lupus Erythematosus.

^a No exclusive concepts.

^b Several rheumatological processes may concur in the same patient.

comfortable managing the Internet. 59% resided in an urban area. The mean distance they travelled to a face-to-face consultation was 33 km, with a total average time investment of 2 h. Most of the patients (74.2%) usually go to the hospital in their own vehicle.

89% of the RTC were successive visits for clinical control or evaluation of analytical results. Mean time of follow-up of the subjects for whom the RTC was practised was 8 years, with a mean of 2 annual check-up consultations. Most of the individuals were diagnosed with osteoarthritis/soft tissue rheumatism or osteoporosis. 21% of the patients presented with rheumatoid arthritis. Revision of biological therapies previously indicated to the patient was performed in 21% of the RTC. In 81% of cases, there were modifications to the treatment of rheumatic patients. The mean duration of RTC was 9.64 min.

The mean levels of satisfaction with the RTC procedure were very high, both for the patient (8.62) and the doctor (8.84). Over 80% of patients attended would repeat the RTC and 79.3% considered them useful. The need for a face-to-face consultation after teleconsultation was not analysed.

The association between the degree of patient and doctor satisfaction with different sociodemographic and geo-functional variables (Table 3) was analysed. No differences in conformity with the RTC were appreciated (in either patient or doctor estimation) according to sex, the existence of disability, the type of transport regularly used for the subject to go to hospital (private transport versus public transport) and the need or non need for a companion. However, we did detect greater satisfaction with RTC, both by the

Table 3
Relationship between sociodemographic variables and level of patient and doctor satisfaction with the rheumatology teleconsultation.

		Level of patient satisfaction with RTC			Level of doctor satisfaction with RTC		
		Mean	Standard deviation	P	Mean	Standard deviation	P
Sex	W	8.61	1.52	.79	8.8	1.52	.139
	M	8.65	1.49		8.99	1.24	
	Total	8.62	1.51		8.84	1.44	
Skilled in ICTs management	No	8.26	1.65	<.001	8.46	1.62	<.001
	Yes	8.96	1.29		9.20	1.15	
Educational levels	Primary	8.32	1.61	<.001	8.61	1.54	<.001
	Secondary	8.73	1.35		8.92	1.30	
	Higher	9.41	1.14		9.43	1.19	
Disability	No	8.63	1.50	.72	8.86	1.41	.459
	Yes	8.56	1.55		8.73	1.59	
Goes to consultation in own car	No	8.72	1.38	.40	8.90	1.49	.615
	Yes	8.59	1.55		8.82	1.43	
Goes to consultation in public transport	No	8.59	1.55	.40	8.82	1.43	.615
	Yes	8.72	1.38		8.90	1.49	
Goes alone	No	8.64	1.42	.81	8.85	1.34	.889
	Yes	8.61	1.56		8.83	1.50	
Needs accompaniment	No	8.66	1.48	.26	8.89	1.43	.143
	Yes	8.46	1.63		8.65	1.49	

ICTs: Information and Communication Technologies; M: Men; RTC: Rheumatology Teleconsultation; W: Women.

patient and the doctor, when the level of education was higher and the individual referred to better Internet management ($P < .001$).

From the patient's viewpoint, if we relate the use of non use of the RTC with sociodemographic variables we do not find any association with the patient's sex, the ability in management of new information and communication technologies (ICTs), the existence or not of disability, type of transport used to attend face-to-face consultations or the need for a companion to go to the hospital. However, an association with the patient's educational level was detected: subjects with a lower educational level found RTC less useful than those with medium or higher educational levels ($P = .005$). The subjects who had to go to face-to-face consultations with companions found RTC more useful than those who did not need accompanying ($P = .033$). When the doctor was asked about the ideal way of repeating RTC and they tried to relate it to sociodemographic and geo-functional variables of the patient they did not detect statistically significant associations with sex, type of transport to visit the hospital and the need or non need for accompaniment to attend their regular face-to-face consultation. We did detect that the rheumatologist believed repetition of RTC was less ideal if the patient lacked ICT skills ($P = .013$) and all the more so if the patient had a disability ($P = .05$).

Table 4 shows the relationship between the degree of patient/doctor satisfaction and the clinical variables. No association was found between the level of satisfaction of both with the complexity of the treatment, the difficulty in diagnosis, the existence of psychiatric comorbidity (depression/anxiety), treatments with calcium, anti-osseous reabsorption agents, glucocorticoids, methotrexate, anti-TNF or anti-IL-6. Only for the doctors was a statistically significant association detected between satisfaction with RTC and cardiovascular comorbidity and the type of successive visit. Specifically, the rheumatologist was less satisfied when the patient who they were applying RTC to presented with cardiovascular comorbidity ($P = .005$). In contrast, the satisfaction of the doctor was higher when the RTC involved provision of analytical outcomes or complementary tests ($P = .009$) or the former plus an adjustment to treatment ($P = .001$). This association was not detected when the RTC involved delivery of results from bone mineral density tests.

Due to the high scores in RTC evaluation the cut-off point was a score under or equal to 8, against one higher than this value. If we establish the threshold as highly favourable satisfaction to the intervention with RTC where the patient has a NVS equal to

or higher than 8 (Table 5) we appreciate (both in the patient and doctor score) a statistically significant association of this level with a higher ability and training in ICTs ($P < .001$) and a higher level of education ($P < .001$). The degree of patient/doctor satisfaction with the RTC is not influenced by the rheumatic disease presented by the patient.

Finally, the most ideal patient profile to apply RTC to, according to the patient estimation (Table 6), after logistic regression, was that of a person with a higher education level (OR = 4.33) and skills in ICTs management (OR = 2.02). Rheumatologist were also more satisfied when the RTC included laboratory control or another diagnostic test or therapeutic adjustment (OR = 2.25) and also with the patient's skill in ICTs management (OR = 3.22). Curiously, the distance covered to the face-to-face consultation had no impact on this model.

Discussion

The coronavirus pandemic and the strategies for preventing it spreading have forced us to make rapid changes to the standard healthcare model.¹¹ One of the most relevant changes was the great advance in the establishment of TC. The emergence of TR and RTC is allowing us to develop innovative channels of communication between specialists and their patients, in circumstance like the present, where the physical presence of patients in health centres is not advisable.¹²

Although there is broad and widespread favourable opinion towards TR,^{13,14} the body of scientific evidence which supports it is limited.¹⁵ McDougall et al.⁸ carried out a systematic review of published evidence (between 1946 and 2015) on TR in the diagnosis and treatment of autoimmune inflammatory rheumatic diseases, mainly rheumatoid arthritis. They confirmed that clinical trials are scarce and cost-effectiveness studies performed to assess the same. Also, the effectiveness of TC in rheumatology may vary depending on the disease, the phase of its evolution and the method of TC used. As a result there is interest in studies like ours, where we cover a broad patient sample, with a vast range of diseases, evolution times, years, therapies and healthcare follow-up.

It has been demonstrated that control of diseases such as RA is conditioned by distance between the patient's place of residence and their health centre of reference, particularly in rural areas in the U.S.A., and within the MediCare system.^{16–18} The Veteran Department, in that country has regularly used TC strategies to care for

Table 4
Usefulness of rheumatology teleconsultation for the patient: relationship with sociodemographic and clinical variables.

Variable		Usefulness of RTC			P
		No %	Yes %	Total %	
Sex	W	74.4	68.7	69.8	.301
	M	25.6	31.3	30.2	
ICTs skills	No	54.7	46.1	47.7	.152
	Yes	45.3	53.9	52.3	
Level of education	Primary	60.5	50.1	52.1	.005
	Secondary	34.9	31.0	31.7	
	Higher	4.7	18.9	16.2	
Disability	No	79.1	84.6	83.6	.209
	Yes	20.9	15.4	16.4	
Goes in own car	No	20.9	26.1	25.2	.315
	Yes	79.1	73.9	74.8	
Goes on public transport	No	79.1	73.9	74.8	.315
	Yes	20.9	26.1	25.2	
Goes alone	No	46.5	34.2	36.5	.033
	Yes	53.5	65.8	63.5	
Needs accompaniment	No	75.6	81.7	80.5	.199
	Yes	24.4	18.3	19.5	
Treatment managed by	Primary HC	48.8	58.8	56.9	.094
	Requires rheumatological control	51.2	41.2	43.1	
Difficult diagnosis	No	33.7	38.5	37.6	.405
	Yes	66.3	61.5	62.4	
Psychiatric comorbidities	No	91.9	91.6	91.7	.948
	Yes	8.1	8.4	8.3	
RTC for provision of analyses/tests	No	34.9	37.2	36.8	.689
	Yes	65.1	62.8	63.2	
RTC for provision of analyses/tests + adjustment to treatment	No	31.4	32.9	32.6	.791
	Yes	68.6	67.1	67.4	
Cardiovascular comorbidity	No	47.7	46.9	47.0	.897
	Yes	52.3	53.1	53.0	
Treatment control with MTX/anti-TNF/GC	No	60.5	63.9	63.2	.554
	Yes	39.5	36.1	36.8	
Treatment control with bisphosphonates/Ca	No	67.4	69.0	68.7	.779
	Yes	32.6	31.0	31.3	
Treatment control with denosumab/Ca	No	67.4	69.5	69.1	.704
	Yes	32.6	30.5	30.9	
Treatment control with MTX/anti-IL-6/GC	No	70.9	72.2	72.0	.808
	Yes	29.1	27.8	28.0	
Rural/urban residence	<Rural	47.7	38.8	40.5	.131
	Urban	52.3	61.2	59.5	
Distance travelled to go to face-to-face consultation	<25 km	48.8	63.6	60.8	.037
	25–50 km	30.2	20.2	22.1	
	>50 km	20.9	16.2	17.1	

GC: Glucocorticoids; ICTs: Information and Communication Technologies; IL-6: Interleukin 6; M: Men; MTX: Methotrexate; RTC: Rheumatology Teleconsultation; TNF: Tumour Necrosis Factor; W: Women.

ill patients who reside in rural areas and have difficulty attending face-to-face sessions in health centres. Wood et al.,¹⁰ prospectively analysed in this collective the usefulness of RTC in the activity metrics of inflammatory arthropathies, the level of patient satisfaction and the cost-saving involved in intervention (on avoiding the need to travel and movement of patients). The authors compared a group of patients with face-to-face consultations with another of RTC; they found there were no significant differences in clinical control or satisfaction but these did exist in distance and money spent on each visit, in favour of RTC.

In our patient sample, the mean distance saved regarding RTC was over 30 km; 17% of the patients attended via teleconsultation lived over 50 km away. The mean time save was also notable in our study; the mean duration of the TC was under 10 min, whilst the mean time invested in the face-to-face consultation was 2 h. This saving of a journey means that the patient has fewer expenses and also a lower risk of accidents whilst driving their vehicle. Society also benefits in the reduction in fossil fuel consumption and global warming.

The ideal patient profile for RTC, according to our study, is a person with a higher educational level and skill in managing ICTs. The rheumatologists agreed that RTC could be used for successive

visits when handing out the results of analyses or complementary tests or analyses and treatment adjustment.

Our study encompassed a wide patient sample, higher than many of the published studies.^{8,19–21} Also, it did not only research patients with inflammatory arthropathies,^{18,19} but also included a wide range of rheumatic processes and, above all, patients with osteoarthritis/rheumatism of soft tissue and osteoporosis. Many of our patients resided in rural areas, with difficult access to care by rheumatology specialists. In all of these circumstances, the RTC initiative was satisfactory and useful, in the opinion of the patient and the doctor, as was also detected in many other published studies.^{22–24} However, further research is needed to establish under what circumstances, with what protocols, for which diseases and in what phase of evolution the RTC may replace traditional face-to-face consultation.^{8,15,25,26}

The COVID-19 pandemic has driven TC as a technological and organisational alternative which must allow our patients to be cared for under certain conditions, facilitate their access to the healthcare system and enhance patient safety and that of the rest of the population.^{11,27} The Spanish Medical College Organisation has established²⁸ that RTC can replace and at times complete the face-to-face medical act because this is not possible, or advisable or

Table 5
Relationship between level of satisfaction (patient and doctor) very favourable (≥ 8) or not (< 8) and demographic and clinical variables.

Variable		Level of patient satisfaction			Level of doctor satisfaction		
		<8	≥ 8	P	<8	≥ 8	P
		%	%		%	%	
Sex	M	70.1	69.9	.972	79.5	68.2	.054
	V	29.9	30.1		20.5	31.8	
ICTs skills	No	67.0	43.6	<.001	72.6	44.0	<.001
	Yes	33.0	56.4		27.4	56.0	
Level of education	Primary	73.2	47.2	<.001	68.5	49.6	.002
	Secondary	20.6	34.1		27.4	32.1	
	Higher	6.2	18.7		4.1	18.3	
Disability	No	77.3	84.8	.078	75.3	84.7	.048
	Yes	22.7	15.2		24.7	15.3	
Goes in own car	No	24.7	25.5	.883	24.7	25.4	.887
	Yes	75.3	74.5		75.3	74.6	
Goes in public transport	No	75.3	74.5	.883	75.3	74.6	.887
	Yes	24.7	25.5		24.7	25.4	
Goes alone	No	37.1	36.6	.924	37.0	36.6	.955
	Yes	62.9	63.4		63.0	63.4	
Needs accompaniment	No	75.3	81.3	.185	74.0	81.2	.158
	Yes	24.7	18.7		26.0	18.8	
Difficult diagnosis	No	36.1	37.7	.774	34.2	37.9	.552
	Yes	63.9	62.3		65.8	62.1	
Psychiatric comorbidities	No	89.7	92.4	.384	89.0	92.4	.340
	Yes	10.3	7.6		11.0	7.6	
RTC with provision of analyses/tests	No	36.1	37.4	.811	47.9	35.1	.037
	Yes	63.9	62.6		52.1	64.9	
RTC with provision of analyses/tests + adjustment to treatment	No	35.1	32.2	.601	45.2	30.5	.014
	Yes	64.9	67.8		54.8	69.5	
Cardiovascular comorbidity	No	37.1	49.3	.032	37.0	48.6	.068
	Yes	62.9	50.7		63.0	51.4	
Treatment with MTX/anti-TNF/GC	No	70.1	60.7	.089	71.2	61.1	.099
	Yes	29.9	39.3		28.8	38.9	
Treatment with biophosphonates/Ca	No	63.9	69.9	.257	69.9	68.4	.811
	Yes	36.1	30.1		30.1	31.6	
Treatment with MTX/anti-TNF/GC	No	75.3	70.5	.352	79.5	70.0	.100
	Yes	24.7	29.5		20.5	30.0	
Rural/urban residence	Rural	45.4	39.0	.258	42.5	39.9	.687
	Urban	54.6	61.0		57.5	60.1	
Distance travelled for face-to-face consultation	<25 km	52.6	62.9	.095	58.9	61.1	.848
	25–50 km	29.9	20.1		24.7	21.6	
	>50 km	17.5	17.1		16.4	17.3	
Grouped diagnoses	AR/APS	34.02	27.03	.468	31.08	27.99	.485
	OP/STR osteoarthritis	36.08	37.84		35.14	37.91	
	Fibromyalgia	4.12	5.68		5.41	5.34	
	RPM	1.03	3.78		0	3.82	

Ca: Calcium; GC: Glucocorticoids; ICTs: Information and Communication Technologies; M: Men; MTX: Methotrexate; OP: Osteoporosis; PsA: Psoriatic Arthritis; RA: Rheumatoid Arthritis; RPM: Rheumatic Polymyalgia; RTC: Rheumatology Teleconference; STR: Soft Tissue Rheumatism; TNF: Tumour Necrosis Factor W: Women;

Table 6
Logistic regression multivariate analysis. Measurement of effect in doctor and patient evaluation: main parameters which conditioned a profile of high satisfaction (equal to or above 8 in VNE 0-100).

Patient satisfaction				Doctor satisfaction			
Level of patient satisfaction	OR	95% CI	P	Level of doctor satisfaction	OR	95% CI	P
Age	1.00	.98–1.01	.655	Age	1.00	.98–1.01	.660
Sex (man)	1.16	.75–1.79	.506	Sex (man)	1.07	.67–1.70	.785
Level of education (primary level as reference)				ICTs skills	3.22	1.84–5.64	.000
Secondary	1.03	.61–1.72	.920	RTC with provision of lab/test results + adjustment to treatment	2.25	1.45–3.48	.000
Higher	4.33	1.89–9.91	.001	Distance travelled for face-to-face consultation			
ICTs skill	2.02	1.14–3.57	.016	25–50 km	.73	.43–1.22	.232
				>50 km	.95	.54–1.69	.867

CI: Confidence Interval; ICTs: Information and Communication Technologies; OR: Odds Ratio; RTC: Rheumatology Teleconsultation; VNS: Verbal Numerical Scale.

because the benefit/risk weighting for the patient recommends it and provided that both parties are satisfied with the decision taken, which must be consensual and not imposed by either of the parties involved.

The TR executed in times of crisis like the one presented in this study was very highly appreciated by the patient and their rheumatologist. Although our patient sample is broad and much higher than that of other recently published studies,⁸ the generalisation of

the results obtained here is controversial because it is a retrospective study and above all, because of the situation of confinement and the emotional impact derived from it, which probably many of our patients presented with. A randomized prospective study would also be needed with 2 groups of individuals, with a wide range of rheumatic processes, monitored in parallel, assessing the activity of the processes by objective and standardised measurements, including the analysis of outcome variables calculated by the

patient. A comparison of the traditional face-to-face care, with RTC follow-up would be required. It would also be advisable to explore the usefulness or non usefulness of TR in initial consultations and circumstances which differed from that of home confinement.

TC is increasingly gaining in popularity.^{11,29,30} We conclude that its use and that of RTC in the evaluation and management of rheumatic disease at a critical time for rheumatology healthcare has been of great use. Rheumatic patients may be followed up and assessed by this procedure in a wide variety of rheumatic disease, including the control and follow-up of biological therapies. It is therefore possible to transfer rheumatological care activity towards TC with a high level of satisfaction for the patient and doctor.

Ethical responsibilities

Approved by the Ethics Committee of the General University Hospital of Guadalajara.

Conflict of interest

The authors have no conflict of interests to declare.

References

1. Sauver St, Warner JL, Yawn DO, Jacobson BP, McGree DJ, Pankratz MEFJ, et al. Why do patients visit their doctors? Assessing the most prevalent conditions in a defined US population. *Mayo Clin Proc.* 2013;88:56–67.
2. Polinski JM, Brookhart MA, Ayanian JZ, Katz JN, Kim SC, Lii J, et al. Relationships between driving distance, rheumatoid arthritis diagnosis, and disease-modifying antirheumatic drug receipt. *Arthritis Care Res (Hoboken)*. 2014;66:1634–43.
3. Walsh JA, Pei S, Burningham Z, Penmetza G, Cannon GW, Clegg DO, et al. Use of disease-modifying antirheumatic drugs for inflammatory arthritis in US veterans: effect of specialty care and geographic distance. *J Rheumatol.* 2018;45:430–6.
4. What is Telemedicine? In: The American Telemedicine Association, editor [Accessed 19 August 2020]. Available from: <https://www.shape.com/lifestyle/mind-and-body/what-is-telemedicine>.
5. Davis P, Howard R, Brockway P. An evaluation of telehealth in the provision of rheumatologic consults to a remote area. *J Rheumatol.* 2001;28:1910–3.
6. Kanthraj GR, Srinivas CR. Store and forward teledermatology. *Indian J Dermatol Venereol Leprol.* 2007;73:5–12.
7. Jong M, Kraishi M. A comparative study on the utility of telehealth in the provision of rheumatology services to rural and northern communities. *Int J Circumpolar Health.* 2004;63:415–21.
8. McDougall JA, Ferucci ED, Glover J, Fraenkel L. Telerheumatology: a systematic review. *Arthritis Care Res (Hoboken)*. 2017;69:1546–57.
9. Piga M, Cangemi I, Mathieu A, Cauli A. Telemedicine for patients with rheumatic diseases: systematic review and proposal for research agenda. *Semin Arthritis Rheum.* 2017;47:121–8.
10. Wood PR, Caplan L. Outcomes, satisfaction, and costs of a rheumatology telemedicine program: a longitudinal evaluation. *J Clin Rheumatol.* 2019;25:41–4.
11. Barrios V, Cosín-Sales J, Bravo M, Escobar C, Gámez JM, Huelmos A, et al. La consulta telemática para el cardiólogo clínico en tiempos de la COVID-19: presente y futuro. Documento de consenso de la Sociedad Española de Cardiología. *Rev Esp Cardiol.* 2020;73:910–8, <http://dx.doi.org/10.1016/j.recresp.2020.06.027> (in press).
12. Kahn JM. Virtual visits—confronting the challenges of telemedicine. *N Engl J Med.* 2015;372:1684–5.
13. Dorsey ER, Topol EJ. State of telehealth. *N Engl J Med.* 2016;375:154–61.
14. Ward IM, Schmidt TW, Lappan C, Battafarano DF. How critical is tele-medicine to the rheumatology workforce? *Arthritis Care Res (Hoboken)*. 2016;68:1387–9.
15. Schmidt T, Lappan C, Battafarano D. Rheumatology e-consult services: a rheumatology workforce management model [abstract]. *Arthritis Rheum.* 2014;66 Suppl:S44.
16. MacLean CH, Louie R, Leake B, McCaffrey DF, Paulus HE, Brook RH, et al. Quality of care for patients with rheumatoid arthritis. *JAMA.* 2000;284:984–92.
17. Lacaille D, Anis AH, Guh DP, Esdaile JM. Gaps in care for rheumatoid arthritis: a population study. *Arthritis Rheum.* 2005;53:241–8.
18. Ferucci ED, Holck P, Gretchen MD, Choromnasky TL, Freeman SL. Factors associated with use of telemedicine for follow-up of rheumatoid arthritis. *Arthritis Care Res (Hoboken)*. 2019;72:1404–9, <http://dx.doi.org/10.1002/acr.24049>.
19. Hampson R, Tierney A, Capell HA, Madhok R. Evaluation of an interactive intelligent telephone based monitoring system for patients with rheumatoid arthritis (RA) [abstract]. *Arthritis Rheum.* 2003;48 Suppl:S460.
20. Nguyen-Oghalai TU, Hunter K, Lyon M. Telerheumatology: the VA experience. *South Med J.* 2018;111:359–62.
21. Rezaian MM, Brent LH, Roshani S, Ziaee M, Sobhani F, Darbeige A, et al. Rheumatology care using telemedicine. *Telemed J E Health.* 2020;26:335–40.
22. Saiz MJ, Cortés JI, Marilla MF, Barrio ID, Olmos CM, García DY, et al. Telephonic rheumatologist nurse consulting: 1 year time experience [abstract]. *Ann Rheum Dis.* 2013;71.
23. Leggett P, Graham L, Steele K, Gilliland A, Stevenson M, O'Reilly D, et al. Telerheumatology: diagnostic accuracy and acceptability to patient, specialist, and general practitioner. *Br J Gen Pract.* 2001;51:746–8.
24. Scalvini S, Tridico C, Glisenti F, Giordano A, Pirini S, Peduzzi P, et al. The SUMMA Project: a feasibility study on telemedicine in selected Italian areas. *Telemed J E Health.* 2009;15:261–9.
25. Mistry H. Systematic review of studies of the cost-effectiveness of telemedicine and telecare: changes in the economic evidence over twenty years. *J Telemed Telecare.* 2012;18:1–6.
26. Davalos ME, French MT, Burdick AE, Simmons SC. Economic evaluation of telemedicine: review of the literature and research guidelines for benefit-cost analysis. *Telemed J E Health.* 2009;15:933–48.
27. World Health Organization. Telemedicine: opportunities and developments in member states [Accessed 25 Ago 2020]. Available from: http://www.who.int/goe/publications/goe_telemedicine_2010.pdf.
28. Organización Médica Colegial de España. Comisión Central de Deontología. La telemedicina en el acto médico. Consulta médica no presencial, e-consulta o consulta online. Madrid, 10 de junio de 2020.
29. Huston JL, Burton DC. Patient satisfaction with multispecialty interactive tele-consultations. *J Telemed Telecare.* 1997;3:205–8.
30. Pal B, Laing H, Estrach C. A cyberclinic in rheumatology. *J R Coll Physicians Lond.* 1999;33:161–2.