

Correlation of Attitudes towards Remote Consultations of a Rheumatologist with Health Locus of Control: Survey of Lithuanian Patients with Chronic Rheumatic Diseases

Dominykas Antinis¹, Jurgita Sabaliauskienė²

¹Lithuanian University of Health Sciences, Faculty of Medicine, Kaunas, Lithuania

²Lithuanian University of Health Sciences, Department of Rheumatology, Kaunas, Lithuania

ABSTRACT

Background: During the COVID-19 pandemic, telemedicine has become an important means to control the disease with the help of a doctor for patients with chronic diseases. To make treatment of chronic rheumatic diseases effective, it is important that patients have a positive attitude towards the remote consulting and maintained health-related individual behavior, which depends on the patient's health locus of control.

Methods: The sample of the survey consists of 207 Lithuanian patients with chronic rheumatic diseases. Most of them have been diagnosed with spondyloarthritis (n=83), connective tissue diseases (n=53) and rheumatoid arthritis (n=49). To reveal the attitude towards remote consultations of a rheumatologist, an original questionnaire has been developed, which includes reasons for prioritizing remote consultations of a rheumatologist, and positive and negative attitude towards the consultations. Health locus of control was assessed by Multidimensional Health Locus of Control (MHLC) scale, which contains Internality, Chance and Powerful Others subscales.

Results: The survey revealed the main reasons why patients with chronic rheumatic diseases choose remote consultations. When comparing the average of statements revealing positive attitude $M=2.78$ with the negative one of $M=1.51$ it becomes obvious that the attitude of subjects towards remote consultations is favorable. A correlation analysis was performed to assess the correlation of patient positive or negative attitudes towards remote consultations with the health locus of control. The results did not establish a correlation between patients' positive attitude towards the named consultations and internality locus of control. However, it has been obtained that a negative attitude towards remote consultations has albeit not strong, but a statistically significant correlation with two indicators of health locus of control – Chance ($r=0.203$, $p\leq 0.0001$) and Powerful Others ($r=0.94$, $p=0.01$).

Conclusion: The survey revealed a favorable attitude of patients with chronic rheumatic diseases towards remote consultations. Furthermore, it showed that personal conviction of a patient that health depends on circumstances and influence of other people worsens the attitude towards remote consultations.

Keywords: telerheumatology, remote consultations, health locus of control.

INTRODUCTION

Chronic diseases require continuous treatment that may last even several decades. High costs of treatment of patients with chronic diseases, the growing spread of chronic diseases and the increasing need of patients to get more easily accessible and higher quality medical services

have stimulated the development of a convenient, inexpensive and practical form of health care, i.e., telemedicine (Bateman & Cleaton, 2021). Remote consultations have become a particularly important and safe means for patients with chronic diseases during the COVID-19 pandemic. Remote

consultations allow establishing a diagnosis, treatment, rehabilitation and patient monitoring (Piga, Cangemi, Mathieu & Cauli, 2017).

The COVID-19 pandemic complicated the treatment of patients with chronic diseases, especially those who are treated with immunosuppressive medications. Accessibility of health services has become particularly relevant to patients with chronic rheumatic diseases seeking to get medical help related to vaccines against COVID-19, potential interaction of medicines used alongside with vaccines, impact of infection on the rheumatic disease, continuation of immunosuppressive treatment, care etc. Before the COVID-19 pandemic in our country, this communication method in rheumatology was not applied, therefore telerheumatology still remains a novelty in Lithuania. Legitimization of remote consultations by a rheumatologist was a very practical solution, especially having in mind the spread of smart technologies among the population.

One of the most important indicators of success of remote consultations is the satisfaction of patients (Granja, 2018). Patient satisfaction, related to remote consultations is indeed relevant, yet is an insufficiently researched area, therefore an increasing number of studies is currently being dedicated to the investigation of patients' attitude towards remote consultations. However, the definition of the notion of "patient satisfaction with treatment" is complicated, because scientists have very diverse views of it: some define satisfaction based on the concept of understanding the result of treatment by a patient, while others follow the concept of patient expectations concerning the treatment (Collins, Nicolson & Bowns, 2000).

In terms of chronic rheumatic patient attitude towards remote consultations, it is important to know the basic advantages and challenges of such consultations, because without this knowledge poor treatment results and low patient satisfaction may occur (Kulcsar Albert, Merrihew & Mecchella, 2014; Kulcsar, Albert, Ercolano & Mecchella 2016). Quantitative (Poulsen, Millen & Lakshman, 2015; Matsumoto & Barton, 2021, etc.) and qualitative (Kulcsar et al., 2016) research is conducted on this subject. Even though rapid growth of the number of studies on remote consulting of patients with rheumatic diseases is being observed, there is a lack of systemic reviews of scientific literature on needs and fears of patients as well as studies that would provide guidelines for future research (Piga, Cangemi, Mathieu & Cauli, 2017).

A favorable attitude of patients towards remote consultations and health related individual behavior of patients, which depends on health locus of control, is important for ensuring effective treatment of chronic rheumatic diseases. As it is known, health related behavior is one of the most important factors determining chronic diseases (Gibek & Sacha, 2019; Lindström & Rosvall, 2020), therefore, the control of a disease is particularly important in treatment of chronic disease (West, Borg Theuma & Cordina, 2018). Available studies prove the correlation of locus of control with the control of chronic diseases (Wang et al., 2021).

Health locus of control is defined as the degree to which individuals perceive that health is the outcome of their own behavior, success or some external phenomena. The concept of health locus of control emerged from J. Rotter's social learning theory. In 1976, Wallston and his colleagues established in science the notion of health locus of control (Wallston, Wallston, Kaplan & Maides, 1976). According to these authors, health locus of control is a psychosocial construct made of three indicators (Duplaga & Grysztar, 2021): 1) *Internality health locus of control*, which reflects conviction of a person that they themselves are capable of affecting their health (Ganjoo, Farhadi, Baghbani, Daneshi & Nemati, 2021). 2) *External chance health locus of control* – when a person believes that health is determined by fate, coincidences or luck. 3) *External powerful others health locus of control* – this is a belief that actions of other people, e.g., efforts of medical professionals, care, and guidance have the greatest impact on health results (Zhu et al., 2022).

Studies show that different types of health locus of control have different impact on various aspects of patient behavior (West, Borg Theuma & Cordina, 2018), however, in general, it has been determined that internal cognitive style has a positive impact on patient oriented health improvement, while Powerful others locus of control and Chance locus of control prevent people from forming the behavior related to concern for their own health (Wang et al., 2021).

Attention of researchers is most often directed towards the Internality locus of control, believing that it is the best predictor of favorable health-related behavior (Kurtovic, Vukovic & Gajic, 2018). Studies show that high results of Internality locus of control reflect better adherence to doctors' recommendations as pertains to use of medicine, while Chance locus of control and Powerful others locus of control, in contrast, reflect disregard of such

recommendations (Náfrádi, Nakamoto, Schulz, 2017). Results of some studies, found in research literature, suggest that Internality locus of control is positively related with the state of well-being and satisfaction (Lee, 2021; Shin & Lee, 2021).

It is known that patients with chronic diseases are better at controlling their illness, but researchers notice that patients with internal locus of control may feel disappointed and helpless because of inability to significantly change their health. Furthermore, it is observed that people having external locus of control may be of better psychological state, because they do not try to control their environment and therefore do not experience a high level of disappointment about their health (Sturmer, Hasselbach & Amelang, 2006). Thus, as is seen, attitude of scientists towards the types of locus of control is ambiguous and the data of empirical research are quite contradictory, therefore it is important to further analyze whether health locus of control could be an effective predictor of patients' health-related behavior.

Studies that analyze chronic rheumatic patients' health locus of control are extremely sparse, however, it is unquestionable that disease control is important for patients suffering from rheumatic diseases (Cross, March, Lapsley, Byrne & Brooks, 2006). It is important to note that we could not find studies that would analyze the correlation between attitude of patients with chronic rheumatic diseases towards remote consultations by a rheumatologist

and health locus of control, therefore we can state that this reflects the novelty of the study.

The objective of the present study is to analyze peculiarities of attitude of patients with chronic rheumatic diseases towards remote consultations of a rheumatologist and correlation of the said consultations with health locus of control.

METHODS

Process and sample of the research. An electronic survey was carried out from 28.01.2021 till 03.02.2021 using Google Forms platform. The developed anonymous questionnaire was distributed across social channels of organizations of patients with rheumatic diseases.

Lithuanian patients with chronic rheumatic diseases make up the convenient sample. 207 subjects filled in the questionnaire electronically. The main demographic characteristics of the subjects are presented in Table 1.

Table 1. Main Demographic Characteristics of Subjects

Characteristic	Value	n	Per cent
Gender	Male	30	14.5
	Female	177	85.5
Age, average ± SN		39.4 ± 11.76	

Health characteristics of subjects are presented in Table 2.

Table 2. Health Characteristics of Subjects

Characteristic	Value	Cases n [*]	Per cent
Illness	Rheumatoid arthritis	49	19.4
	Spondyloarthritis	86	34.1
	Crystal-induced arthritis	3	1.2
	Diseases of periarticular tissue	5	2.0
	Diseases of connective tissue	61	24.2
	Vasculitis	8	3.2
	Bone diseases	9	3.6
	Osteoarthritis of spine and joints	20	7.9
	Unclear diagnosis	11	4.4
Duration of illness	Less than 2 years	28	13.5
	2–5 years	52	25.1
	5–10 years	41	19.8
	Over 10 years	86	41.5
Severity of symptoms	Weak	44	21.3
	Average	117	56.5
	Severe	46	22.2

Note: in the column "Cases" n=252, because subjects had an opportunity to mark several diagnoses

Instruments of the study. The questionnaire of the study was compiled from the original questionnaire designed to assess the attitude towards remote consultations of a rheumatologist, Multidimensional Health Locus of Control Scale (MHLC), and additional questions. In addition, subjects were asked about their demographic peculiarities, e.g., age, gender, education, marital status etc., and about some aspects of their health, e.g., nature of the illness, duration of the illness, severity of symptoms. Ratings of the questionnaire statements vary in Likert's scale from 0 – “completely disagree” to 4 – “completely agree” points, thus 2 points match the middle of the scale.

A questionnaire to assess the attitude of patients with chronic rheumatic diseases towards remote consultations by a rheumatologist was developed by the authors of the present article based on the analysis of scientific literature and empirical studies of other scientists. When developing the questionnaire of this study, essential dimensions of the attitude towards remote consultations were taken into account. It consists of three question blocks: the first includes questions that aim to find out the reasons for prioritizing remote consultations (7 items), the second is intended for uncovering positive (8 items) while the third – negative (10 items) attitude towards remote consultations with a rheumatologist. Statements of the second and third blocks were multiplexed using factor analysis into two separate subscales – Positive attitude towards remote consultations (Cronbach $\alpha=0.934$) and Negative attitude towards remote consultations (Cronbach $\alpha=0.818$).

Health locus of control is measured using Wallston's (1978) *Multidimensional Health Locus of Control Scale* (MHLC). An 18-item questionnaire consists of three subscales: Internality, Chance and Powerful others. The reliability coefficient Cronbach α of the subscales of this questionnaire varies from 0.64 to 0.76.

Statistical Analysis. To process statistical data Windows Microsoft Excel and IBM SPSS Statistic 21 software was used. It has been obtained that, after applying Kolmogorov-Smirnov criterion, all analyzed variables have been distributed not according to normal (Gauss) distribution ($p>0,05$), in the analysis of constructs of the study we relied on non-parametric assumptions.

Various numeric characteristics have been calculated using methods of descriptive statistics: average (M), standard deviation (SD) and absolute

as well as percentage frequencies. To compare continuous variables, non-parametric Spearman correlation coefficient was used. Differences and dependences among the analyzed indicators were considered to be statistically significant when $p\leq 0.05$.

Ethical Statement. The approval Bioethics Center of the Lithuanian University of Health Sciences (No. BEC-MF-207) was obtained on 22.01.2021.

RESULTS

Usually, in studies scientists operate averages of statements or subscales, but it has been proven mathematically and empirically that, instead of dealing with the average, it is possible to give the average per cent of approval to statements (Ingwer & Gabler, 2002). Later percentage frequencies of approval to each statement may be summed up and from the obtained percentage scores of individual statements derive the average per cent of approval for the entire subscale. Consolidated assent percentage is more visual than the average, it is interpreted and understood easier. Therefore, in the present article in addition to routine averages and standard deviations consolidated percentage of approval is presented.

One of the blocks of the questionnaire about the attitudes towards remote consultations of a rheumatologist is dedicated for clarifying reasons why patients with chronic rheumatic diseases choose or would choose remote consultations. Data of the descriptive statistics of this part of the questionnaire are presented in Table 3.

As it has been mentioned, it is much more favorable to interpret results with obtained average approval percentage, in this case differences among the rating of statements are much more obvious.

Each statement of the questionnaire about chronic rheumatic patient attitudes towards remote consultations and each subscale of the questionnaire allow us to evaluate specific dimensions of the attitude of patients towards remote consultations of a rheumatologist. Detailed statistical data of agreement with statements, reflecting positive and negative attitude towards remote consultations, and ratings of subscales are presented in tables 4 and 5.

Peculiarities of health locus of control are analyzed according to three indicators: Internality, Chance and Powerful others. To determine the manifestation of health locus of control among

Table 3. Rating of Reasons Determining Why Patients with Chronic Rheumatic Diseases Would Choose Remote Consultations

No.	Reasons for Prioritizing Remote Consultations	M	SD	Disagree, %	Doubt, %	Agree, %
1	2	3	4	5	6	7
1.1	Remote consultations are more convenient than contact consultations.	1.81	1.15	39.1	33.8	27.1
1.2	One can get a remote consultation faster than an in-person consultation.	2.39	1.16	20.3	26.1	53.6
1.3	I would choose remote consultations because I am afraid to get infected at the medical institution.	1.96	1.29	39.6	22.7	37.7
1.4	I have movement (i.e., walking) difficulties.	1.07	1.24	67.1	14.0	18.9
1.5	It is complicated to reach the medical institution.	1.27	1.27	60.9	17.9	21.2
1.6	Waiting time for an in-person consultation is too long.	2.12	1.29	34.3	24.2	41.6
1.7	By choosing remote consultations I would reduce patient lines in the medical institution.	2.39	1.22	22.7	27.1	50.3

Table 4. Rating of Agreement of Patients with Chronic Rheumatic Diseases with Positive and Negative Attitude towards Remote Consultations of a Rheumatologist

No.	1. Positive Attitude towards Remote Consultations (Cronbach $\alpha=0.934$)	M	SD	Disagree, %	Doubt, %	Agree, %
1	2	3	4	5	6	7
1.1	In general, I am satisfied with remote consultations.	2.63	1.12	16.8	19.8	63.4
1.2	During remote consultations I could tell the doctor all I wanted.	2.63	1.13	16.8	21.5	61.7
1.3	The consulting doctor understood my complaints.	2.72	1.14	12.1	19.6	68.3
1.4	The consulting doctor provided me with the necessary help.	2.82	1.01	8.4	17.8	73.8
1.5	During the consultation I received all the information I needed.	2.73	1.03	10.3	25.2	64.5
1.6	Communication with the doctor was pleasant and friendly.	3.23	0.89	2.8	9.3	87.9
1.7	I felt involved in the decision making about my treatment.	2.68	1.09	12.1	26.2	61.7
1.8	Remote care of the doctor was as good as after an actual visit.	2.37	1.28	24.3	26.2	49.5
No.	2. Negative Attitude towards Remote Consultations (Cronbach $\alpha=0.818$)	3	4	5	6	7
1.1	There will be no possibility to perform additional tests, e.g., ultrasound, blood tests and the like.	2.63	1.26	19.9	16.0	64.1
1.2	The doctor will not physically examine me.	2.88	1.10	10.7	17.0	72.3
1.3	The doctor will not understand my complaints.	1.88	1.22	36.4	32.5	31.1
1.4	I will not be able to describe my complaints precisely enough.	2.01	1.20	34.0	27.2	38.8
1.5	The doctor will not be able to dedicate enough time for the conversation.	1.91	1.23	38.0	29.6	32.0
1.6	I am afraid that my computer skills are too poor.	0.69	1.01	80.6	12.6	6.8
1.7	I do not have access to the equipment necessary for a remote consultation (computer, telephone and the like).	0.44	0.78	89.8	7.8	2.4
1.8	I am not sure that I will be able to get a prescription remotely.	0.58	0.91	87.4	8.3	4.3
1.9	I am concerned about retaining my anonymity or confidentiality of my data in remote consultations.	0.85	1.06	73.8	19.4	6.8
1.10	I am not sure if I will understand doctor's instructions correctly.	1.18	1.18	63.1	22.3	14.6

Table 5. Generalized Descriptive Statistical Data on Positive and Negative Rating of Remote Consultations by Patients with Chronic Rheumatic Diseases

SUBSCALE HEADINGS	Number of Statements	Average	Standard Deviation	Approval Min.	Approval Max.	Average Approval
	Number	M	SD	%	%	%
Positive attitude towards remote consultations.	8	2.78	0.84	49.5	87.9	66.4
Negative attitude towards remote consultations.	10	1.51	0.68	2.4	72.3	27.3

patients with rheumatic diseases descriptive statistics data of subscales of this construct were calculated. General score characteristics of the questionnaire subscales are presented in Table 6.

As it is seen, the most expressed component of health locus of control among subjects is Internality, while the least expressed is Chance locus of control.

To find out whether a correlation exists between chronic rheumatic patients' attitude towards remote consultations by a rheumatologist and health locus

of control, Spearman's correlation coefficient was applied. Correlation between indicators of health locus of control and the subscale of positive attitude towards remote consultations has not been determined, however, correlation with another subscale – negative attitude towards remote consultations – has been found. As is seen in Table 7, a weak correlation between negative attitude towards remote consultations and Chance as well as Powerful others subscales has been found.

Table 6. Descriptive Statistics of Subscales of the Health Locus of Control Questionnaire

	Average	Standard Deviation	Median	Interquartile Interval	Standard Error
Internality Subscale	2.18	0.71	2.17	1.67-2.67	0.05
Chance Subscale	1.60	0.60	1.67	1.17-2.00	0.04
Powerful Others Subscale	2.09	0.61	2.00	1.67-2.50	0.04

Table 7. Data Obtained from Analysis of Correlation between Health Locus of Control and Negative Attitude towards Remote Consultations

Health Locus of Control	Numeric value	
	r	p
Internality	0.040	0.59
Chance	0.203	0.0001
Powerful others	0.184	0.01

DISCUSSION

It has recently become obvious that in rheumatology, telemedicine along with remote consultations will remain an indispensable measure that guarantees continuation of patient care, even when the pandemic period is over. The present study has revealed the attitude of patients with chronic rheumatic diseases towards remote consultations after they have encountered the new experience of communication with a doctor.

Results of the study have highlighted the reasons that prompt people to choose remote consultations.

Seven reasons or statements were presented in the questionnaire. It has been found that the greatest approval is for two statements that reflect reasons for choosing these remote consultations – “One can get remote consultation faster than an in-person consultation” (53.6%) and “By choosing remote consultation I would reduce patient lines in the medical institution” (50.3%). Quite a few subjects support the statement “Waiting time for an in-person consultation is too long” (41.6%). Approval of other statements is lower. It is important to mention

that subjects, in addition to given choices, had an opportunity to freely specify other reasons. Other specified reasons were: “There is no need to leave work”, “There is no need to travel far”, “Money is saved” and the like. Similar studies carried out in other cultures show that reasons why rheumatic patients choose remote consultations elsewhere are similar, e.g., it takes too long to wait for a direct consultation, concern about getting infected during an in-person consultation, etc. (Opinc, Łukasik & Makowska, 2020).

It is expedient to analyze the obtained results of positive and negative attitudes towards remote consultations on an individual statement and generalized approval percentage level. When analyzing individual statements of the subscale of positive attitude towards remote consultations it is obvious that the greatest patient approval percentage is for the statement “Communication with doctor was pleasant and friendly” (87.9%), also high approval is observed for the statement “The consulting doctor provided me with the necessary help” (73.8%), while the least supported opinion is that “Remote care of the doctor was as good as after an actual visit” (49.5%). Some scientists maintain that when comparing in-person consultations with remote ones it has been observed that patients are essentially satisfied with remote consultations, but they would also like to get physical in-person consultations (Collins, Nicolson & Bowns, 2000).

In the subscale of Negative attitude towards remote consultations, anxiety of patients that the doctor would not examine them physically is observed (72.3%) and that there would be no possibility to carry out additional tests, e.g., ultrasound, blood tests and the like (64.1%). When comparing with the results obtained by Polish scientists it may be noted that nearly half of their subjects, same as our subjects, are mostly concerned about physical examination by doctors and additional tests (Opinc, Łukasik, Makowska & 2020). Lithuanian patients also worry that they will not be able to properly explain their symptoms remotely, the doctor will not understand complaints or will not be able to dedicate enough time for the conversation. When analyzing statements reflecting negative attitude it becomes apparent that all other concerns are expressed far less. In the neighboring country, unlike in Lithuania, patients are much more concerned about the possibility to get a prescription remotely.

When comparing average approval percentage of positive and negative attitude towards remote consultations (see Table 5) it becomes obvious that positive attitude (66.4%) is supported much more than negative (27.3%). Other researchers obtain similar data, e.g., data obtained by Kulcsar and his colleagues show that the indicator of overall satisfaction with remote consultations by patients is as high as 66%, while 25% of patients believe that remote consultations are more convenient than an in-person visit (Kulcsar et al., 2016).

It is worthwhile noting that some researchers obtain that as many as 90% of subjects feel satisfaction with remote consultations by a rheumatologist, while 97% of patients feel satisfaction with in-person consultations by the same specialists (Leggett et al., 2001), hence it may be expected that about 10% of patients dissatisfied with remote services most likely are satisfied with neither remote, nor in-person consultations (Roberts, LaMont, Lim, Sabesan & Barrett, 2012).

Based on the mentioned and various other research data, the team of scientists that performed the study of patient satisfaction with remote consultations suggested to combine offering remote and in-person services of health care. They recommend, that in order to increase the reliability of diagnostic evaluation, to start with contact physical examination and consultation of a patient and later proceed with remote communication (Poulsen et al., 2015). Thus, rheumatic care may be transferred to remote with great degree of satisfaction for both the patient and the doctor (Tornero-Molina, Sánchez-Alonso, Fernández-Prada, Bris-Ochaita, Sifuentes-Giraldo & Vidal-Fuentes, 2021).

As is known, patients’ attitude towards health care services is related to subjective assessment of their own health, which in turn is related to health locus of control that affects health-improving behavior (Boyle & Sielski, 1981).

Data of the present study have revealed that estimating by the average of evaluation, Internality health locus of control stood out most significantly ($M=2.18$). It is likely that these people will better adapt to their chronic rheumatic disease and will try to change their behavior in a “healthier” direction, will participate in the treatment process, will follow a doctor’s instructions and the like (Ganjoo et al., 2021). Significant others health locus of control is slightly less expressed ($M=2.09$); individuals of this type will entrust doctors with their health and they will most likely maintain a paternalistic

attitude towards treatment (Lindström & Rosvall, 2020). The lowest average was of Chance health locus of control ($M=1.60$); it may be supposed that these people are passive and most often do not solve health-related problems, which only deteriorates their current health condition.

Though it was possible to predict that Internality health locus of control will be related to positive attitude towards remote consultations by a rheumatologist, data of the study have not confirmed this. However, it was obtained that negative attitude towards remote consultations by a rheumatologist, though weakly, but statistically significantly correlates with two indicators of health locus of control – Chance ($r=0.203$, $p\leq 0.0001$) and Powerful others ($r=0.194$, $p=0.01$).

CONCLUSIONS

In summary, it may be said that the main reason why patients with chronic rheumatic diseases choose remote consultations of a rheumatologist is

the possibility to get the remote consultation faster and easier. The greatest concern of patients is that in remote consulting they will not be examined physically and will not be able to get additional tests. Satisfaction with remote consultations is related to pleasant and friendly remote contact with the physician. Furthermore, patients appreciate the help provided by the doctor as well as the fact that the doctor is able to understand complaints of the patient during the remote consultation. Overall, two thirds of subjects feel satisfied with remote consultations.

Results of the study have shown that among patients with chronic rheumatic diseases Internality health locus of control is most expressed, while the least expressed is Chance locus of control. When looking for a correlation between positive and negative attitude towards remote consultations is has been found that personal conviction of a patient that health depends on circumstances and influence of other people worsens the attitude towards remote consultations.

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Received on March 27, 2022

Accepted on April 08, 2022