



ORIGINAL RESEARCH

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## Assessment of the health workers' knowledge and belief about rheumatic and musculoskeletal diseases and spa treatments: A descriptive study

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### Abstract

To investigate identifying the knowledge levels, behavior attitude and belief levels about rheumatic and musculoskeletal diseases (RMDs) and spa treatments (ST) among health workers in communication with patients and determining target groups for health training. Cross-sectional, descriptive study. Bolu İzzet Baysal Physical Medicine and Rehabilitation Education and Research Hospital and İzzet Baysal Education and Research Hospital 01.04.2019-15.04.2019. 600 participants completed 6 descriptive questions with yes-no answers about demographic characteristics and completed a survey determining knowledge levels about RMDs and ST as correct or incorrect. Though there was statistically significant difference in favor of women about RMDs knowledge level, there was no statistically significant difference between 2 groups for ST knowledge levels. When RMDs and ST knowledge levels are compared, doctors and physiotherapists had statistically similar knowledge levels, with statistically significant level of difference compared to the other groups. Among groups reporting similar opinions about the efficacy of ST, there was no statistically significant difference identified between RMDs knowledge levels, with a statistically significant level of difference identified for ST knowledge levels. Apart from doctors and physiotherapists, 307 other health workers did not have RMDs themselves or in their family, while only 167 had RMDs themselves and 126 stated both they and their family had RMDs. There was a statistically significant difference identified for RMDs knowledge levels. We found that even among the health workers who communicate with patients in hospitals, the level of knowledge with RMDs and ST is very variable. Taking this into account, we believe that all personnel should be provided with supportive scientific information and training in order to ensure that the health workers who are intertwined with the health problems of the individuals reach the correct information.

**Keywords:** Rheumatic and musculoskeletal diseases, spa treatments, health facility workers, knowledge level, health training

### Introduction

Rheumatic and musculoskeletal diseases (RMDs) are a diverse group of diseases that commonly affect the joints, but can also affect the muscles, other tissues and internal organs(1). Rheumatic diseases, also called musculoskeletal diseases[1], are among the oldest known diseases of the musculoskeletal system. Findings related to arthritis, gout and osteoarthritis are found in many skeletons in archeological excavations. Hippocrates used the term “rheuma” in the fifth century before Christ. Hippocrates observed it was related to Podagra’s rich lifestyle and called it the “rich people’s arthritis”[2]. The first doctor accepting health and disease theory with similarities to molecular medicine, Asclepiades is known to have chosen mild therapeutic methods like a healthy

diet, exposure to light, hydrotherapy, massage and physical exercise to improve health status [3]. Nowadays, musculoskeletal system diseases are among common chronic diseases and are a large public health problem for aging societies [4]. The knowledge and beliefs formed in society from the past to the present may lead to false and inadequate information, and serious delays in the diagnosis and treatment of the disease.

Providing better information of good quality to the general population and patients is an important strategy for treatment of chronic diseases. Information leads to changes in attitude and behavior and directly affects health status [5]. Education of patients with rheumatic diseases has been shown to have positive effects in terms of treatment, functional capability, global assessment, psychological well-being and depression [6]. Workers in health organizations in continuous dialogue with patients play an important role in ensuring accurate information related to disease and treatment reaches patients. As a result, a common language should be created to provide good communication about chronic

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or life-threatening diseases especially between patients and health workers [7].

We planned this survey study with the aim of identifying the knowledge levels, behavior attitude and belief levels about RMDs and spa treatments (ST) among health facility workers in direct communication with patients and determining target groups for health training.

## Material and Methods

### Study design

This study was planned as a cross-sectional and descriptive survey study at Bolu İzzet Baysal Physical Medicine and Rehabilitation Education and Research Hospital, in accordance with the Declaration of Helsinki. Ethics committee permission was received.

### Study environment and participants

The research was completed from 01.04.2019-15.04.2019 and the population of the research comprised 4,936 personnel working in health organizations in Bolu province [8]. The sample size was determined as 586 people taking a population of 5000 with 99% confidence level and 5% error using the Raosoft, Inc program (<http://www.raosoft.com/samplesize.html>). The sample size was determined as 600 for the health workers by taking into account the problems that will be experienced in the returns of the measurement instrument. "Simple random sampling" method was used in the selection of samples. Samples were taken from 2 hospitals by making an impartial selection for the target sample size. A random total of 642 people were asked for their participation. The first 600 people who agreed to participate in the study and signed the written consent were included in the study.

Data were collected during face-to-face interviews between the researcher and individuals who accepted participation in the research.

### Bias

To prevent misunderstanding of questions by all participants, the aim of the study and explanations related to the questions were provided. The researcher avoided misleading-leading interpretations and reactions. All surveys were completed as reported by the workers.

### Data sources

In this study, the data were collected by the researchers through two forms developed by taking the sample from previous studies in Turkey [9–11].

The research collected information using a standard survey protocol containing more than one question in the study. Participants completed 6 descriptive questions with yes-no answers about demographic characteristics including profession, age and gender and completed a survey determining knowledge levels about RMDs and ST as correct or incorrect (Table 1).

### Statistical Assessment

Data obtained in the research used SPSS 22.0 software for statistical analysis. The answers to questions about knowledge levels of participants about RMDs and ST were determined to

be right (1 point) or wrong (0 points). The total points obtained for correct answers were accepted as the knowledge level of the individual. Points obtained for RMDs and ST were determined not to have normal distribution as a result of the Kolmogorov Smirnov test. As a result, the Mann Whitney U test was used to compare two categorical variables and the Kruskal Wallis test was used to compare more than two variables in categories like profession. If statistically significant differences were found as a result of the Kruskal Wallis test, the Mann-Whitney U test was used again in two-way comparisons with the aim of determining which group or groups caused the difference and p values were determined with the Bonferroni correction. For these comparisons,  $p < 0.05$  was determined to be the level of statistical significance. With the aim of determining statistically significantly different groups in comparisons, different letters were used and are given beside the means. Groups with the same letter were not identified to be statistically different ( $p > 0.05$ ). Descriptive statistics are given as arithmetic mean, standard deviation, median, minimum and maximum values. Table 1 calculates the proportional distribution of responses given to questions used in the study.

## Results

The study, completed with 600 people in different professional groups in health organizations, had gender distribution of 371 females (61.8%) and 229 males (38.2%). The mean age of the participants was  $34.73 \pm 9.04$  years. The frequency and proportions of workers according to professional group are summarized in Table 2.

Though there was a statistically significant difference in favor of women for correct answers to questions about RMDs knowledge level when examined in terms of gender (females  $8.32 \pm 2.27$  vs males  $7.46 \pm 2.45$ ,  $p < 0.0001$ ), there was no statistically significant difference between the 2 groups for ST knowledge levels (females  $8.96 \pm 2.21$  vs males  $8.79 \pm 2.19$ ,  $p: 0.2298$ ) (Table 3).

When RMDs and ST knowledge levels are compared in the professional groups, doctors and physiotherapists had statistically similar knowledge levels, with a statistically significant level of difference compared to the other professional groups (Table 4).

While 88 workers (14.7%) stated that spa treatment was not effective, 512 (85.3%) stated that spa treatment was effective. Among groups reporting similar opinions about the efficacy of ST, there was no statistically significant difference identified between RMDs knowledge levels ( $p: 0.1515$ ), with a statistically significant level of difference identified for ST knowledge levels ( $p: 0.0347$ ) (Table 5).

Apart from doctors and physiotherapists, 307 other health workers (51.2%) did not have RMDs themselves or in their family, while only 167 (27.8%) had RMDs themselves and 126 (21.0%) stated both they and their family had RMDs. While there was no statistically significant difference between the ST knowledge levels of individuals working in these groups ( $8.50 \pm 2.25$ ,  $8.78 \pm 1.90$ ,  $8.99 \pm 1.68$ , respectively,  $p: 0.1432$ ), there was a statistically significant difference identified for RMDs knowledge levels ( $8.55 \pm 1.89$ ,  $7.80 \pm 2.33$ ,  $5.84 \pm 2.29$ , respectively,  $p < 0.0001$ ) (Table 6).

**Table 1.** Proportional distribution of responses given to questions used in the study

	<b>Descriptive Questions</b>	<b>No</b>	<b>Yes</b>
1	Have you received any training or information about rheumatic diseases previously?	55.7	44.3
2	Do you have any rheumatic disease?	71.5	28.5
3	Are there any individuals with rheumatic disease in your family (first degree relatives)?	58.7	41.3
4	Have you gone to a spa previously?	25.7	74.3
5	Are spa treatments effective?	14.7	85.3
6	Do you believe in spa treatment?	61.2	38.8
	<b>Rheumatic and Musculoskeletal Diseases (RMDs)</b>	<b>Incorrect</b>	<b>Correct</b>
1	“RMDs” are infectious (no)	22.2	77.8
2	Family history and genetic factors are important for “RMDs”(yes)	17.3	82.7
3	“RMDs” may cause injury to organs like the lungs and heart(yes)	25.5	74.5
4	“RMDs” are female diseases and not observed in males(no)	18.7	81.3
5	“RMDs” may occur in children, young people, adults and elderly patients(yes)	12.8	87.2
6	Osteoarthritis is a “RMDs” (yes)	36.2	63.8
7	“RMDs” can generally be controlled by mild pain killers and muscle relaxant medications(no)	46.3	53.7
8	“RMDs” only damage the joints(no)	34.7	65.3
9	Only medications are used for treatment of “RMDs” (no)	33.7	66.2
10	There is no place for rehabilitation and exercise in treatment of “RMDs” (no)	22.0	78.0
11	There is no treatment for “RMDs” (no)	31.0	69.0
	<b>Spa treatment</b>	<b>Incorrect</b>	<b>Correct</b>
1	Spa treatment are good for all patients with RMDs. (no)	25.5	74.5
2	Spa treatments are good for all patients with inflammatory RMDs (no)	58.7	41.3
3	Spa treatments may ameliorate acute attacks in patients with inflammatory RMDs (no)	46.7	53.3
4	Those with inflammatory RMDs cannot go to the spa(no)	58.0	42.0
5	Spa treatment is only pool treatment(no)	35.5	64.5
6	Spa treatment should last at least 10 days(no)	42.3	57.7
7	Spa treatment should last at least 21 days(no)	57.5	42.3
8	Walking and exercise can be done in the spa pool (above 38 C) (no)	52.0	48.0
9	Without noting the temperature of the spa pool, it is beneficial to stay for at least 20 minutes(no)	65.0	35.0
10	Spa is only good for pain (no)	32.5	67.5
11	Spa increases the body’s resistance (yes)	30.7	69.3
12	Those with any heart disease should not go to the spa(no)	63.3	36.7
13	Spa treatment should be only applied for painful situations like low back-neck-knees(no)	45.5	54.5
14	Spa treatment is only popular in our country (no)	44.3	55.7
15	Only elderly go to the spa (no)	15.0	85.0
16	Spa treatment is common in Europe(yes)	38.0	62.0

Ultrasonography records demonstrated that 73 (60.8%) out of 120 patients did not suffer from fatty liver disease. Fatty liver disease was identified in 47 (39.2%) patients (Grade 1: 37 patients, and Grade 2: 10 patients). No patients were reported with Grade 3 fatty liver disease.

Of the 47 patients with fatty liver disease, 27 were male, and 20 were female patients. The mean age of these patients was  $54.8 \pm 12.7$ , and the mean age of 73 patients with a typical liver was  $38.7 \pm 17.2$  ( $p < 0.05$ ).

The number of patients with a concomitant chronic disease with seborrheic dermatitis was 56 (46.6%). The most prevalent diseases included hypertension (17.5%), diabetes (11.6%), hypothyroidism (7.5%), and hyperlipidemia (5%), respectively. The mean age of these patients was  $55.9 \pm 13.5$ , and the mean age of the patients without seborrheic dermatitis was  $37.03 \pm 16.4$  ( $p < 0.05$ ) (Table 2).

Thirty-three (59%) of 56 patients with seborrheic dermatitis and concomitant chronic disease had fatty liver disease, while only 14 (22%) of 64 patients without the concomitant chronic disease had fatty liver disease ( $p < 0.05$ ) (Figure 1).

**Table 2.** Distribution of professional groups

Profession	Frequency	Proportion (%)
Doctor	32	5.3
Physiotherapist	46	7.7
Nurse	156	26
Physical therapy technician	20	3.3
Health officer	88	14.7
Medical secretary	135	22.5
Administrative personnel	123	20.5
<b>Total</b>	<b>600</b>	<b>100</b>

Fatty liver disease was observed in 11 of 14 patients with diabetes, in 12 of 21 patients with hypertension, in 4 of 9 patients with hypothyroidism, and 3 of 6 patients with hyperlipidemia (Table 3).

**Table 3.** Comparison of Rheumatic and Musculoskeletal Diseases (RMDs) and Spa Treatments (ST) knowledge levels in terms of gender

Gender	n	RMDs			ST		
		Mean±Std D.	Median	Min-Max	Mean±Std D.	Median	Min-Max
Female	371	8.32±2.27	9	2-11	8.96±2.21	9	3-15
Male	229	7.46±2.45	8	2-11	8.79±2.19	9	3-16
<b>p value</b>		<b>&lt;0.0001</b>			<b>0.2298</b>		

**Table 4.** Comparison of Rheumatic and Musculoskeletal Diseases (RMDs) and Spa Treatments (ST) Spa Treatments (ST) ST knowledge levels between professional groups

Profession	n	RMDs			ST		
		Mean±Std D.	Median	Min-Max	Mean±Std D.	Median	Min-Max
Doctor	32	10.00±1.14 A	10	6-11	10.63±3.01 A	10.5	4-15
Physiotherapist	46	9.83±1.70 A	10	3-11	9.93±2.52 A	10	4-16
Nurse	156	7.90±2.42 B	9	2-11	9.04±2.08 B	9	3-14
Physical therapy technician	20	7.85±1.66 B	8	4-10	8.30±2.34 B	8	4-11
Health officer	88	7.48±2.46 B	8	2-11	8.52±1.97 B	9	3-13
Medical secretary	135	7.77±2.44 B	8	2-11	8.77±1.98 B	9	3-14
Administrative personnel	123	7.54±2.18 B	8	3-11	8.36±2.00 B	9	3-15
<b>p value</b>		<b>&lt;0.0001</b>			<b>&lt;0.0001</b>		

**Table 5.** Comparison of Rheumatic and Musculoskeletal Diseases (RMDs) and Spa Treatments (ST) knowledge levels in terms of opinions of spa treatment efficacy

Is spa treatment effective?	n	RMDs			ST		
		Mean±Std D.	Median	Min-Max	Mean±Std D.	Median	Min-Max
No	88	7.63±2.49	8	2-11	8.39±1.89	9	3-12
Yes	512	8.06±2.35	9	2-11	8.98±2.24	9	3-16
<b>p value</b>		<b>0.1515</b>			<b>0.0347</b>		

**Table 6.** Comparison of Rheumatic and Musculoskeletal Diseases (RMDs) and Spa Treatments (ST) knowledge levels between health personnel

Is there rheumatic disease?	n	Mean±Std D.	RMDs		ST		
			Median	Min-Max	Mean±Std D.	Median	Min-Max
No*	253	8.55±1.89 A	9	2-11	8.50±2.25	9	3-15
In themselves*	148	7.80±2.33 B	9	3-11	8.78±1.90	9	3-13
In themselves+family*	121	5.84±2.29 C	5	2-11	8.99±1.68	9	5-14
		<0.0001			0.1432		
No**	54	9.96±1.13	10	6-11	10.07±2.72	10	4-15
In themselves**	19	10±1.83	10	3-11	10.11±2.56	10	5-16
In themselves+family**	5	8.8±3.03	11	5-11	12.2±3.42	14	8-15
		0.2366			0.2491		

Different superscript capital letters show statistically significant differences for between-group comparisons ( $p < 0.05$ ).

\* health personnel apart from doctors and physiotherapists \*\* doctors and physiotherapists

## Discussion

In our study, the aim was to determine the knowledge levels and factors affecting individual knowledge levels about RMDs and ST among personnel employed in health facilities frequently encountering patients with RMDs in our province with ST demanded by patients. As there is no other study assessing RMDs and ST knowledge of health workers in the literature, our study is the first to evaluate the level of knowledge about RMDs and ST together. The RMDs knowledge levels of workers were shown to vary in terms of gender and professional group, while ST knowledge levels varied by professional groups and opinions about the efficacy of spa treatments. It was identified that females ( $8.32 \pm 2.27$ ) answered questions related to RMDs correctly statistically significantly more often than males ( $7.46 \pm 2.45$ ) ( $p < 0.0001$ ). Participants who considered ST to be effective and doctors and physiotherapists in both the RMDs and ST groups answered more questions correctly.

RMDs are divided in two as noninflammatory and inflammatory [12]. The frequency of noninflammatory RMDs generally increases with age. Inflammatory RMDs are systemic diseases involving the joints mainly, but also different organs. During this process, informing and training the patient is important in terms of success of monitoring and treatment and also improving the patient's quality of life. Generally, participants provided correct answers at high rates to most questions related to RMDs; however, they were identified to have more wrong answers (53.7%, 66.2%, 69%, respectively) in response to questions about treatment RMDs questions 7, 9 and 11) compared to other questions. 74.5 % of participants reported that RMDs may involve different organs, while 65.4% responded that only the joints were affected. This contradiction and lack of knowledge about treatment methods reveals that health workers require serious and continuous training.

ST involve many medical applications and are commonly-used nonpharmacologic methods for treatment of musculoskeletal system disorders [13–16]. Practices specific to spas like thermal mineral water baths, mud baths, aqua exercise, traction in water and shower applications along with natural and traditional practices like exercise, massage, and diet applied in most spa centers make spas attractive for health [17]. Forming an ideal

environment for spiritual and mental health, not just physical and bodily health, distant from stress and tiredness caused by daily life, spas are currently used not just for treatment aims, but to preserve health and by many people who want to live more healthily [18]. However, mistaken beliefs and information coming from traditional use in Turkey are commonly encountered in society. Within the scope of the study, of 16 questions relating to ST, 6 questions had wrong answer rates of more than 50% (questions 2, 4, 7, 8, 9, 12 had wrong answer rates of 58.7%, 58%, 57.5%, 52%, 65% and 63.3%, respectively). It appears questions about whether patients with inflammatory RMDs could benefit from spas or not had wrong answers above the mean (questions 2 and 4). Along with mistaken information about the use of ST, it was identified that questions related to the use of ST by those with heart disease and the length of time spent in hot pools had highest wrong answer rates (questions 7, 8, 9 and 12). We think the high mistaken rates identified are due to habits and reservations coming from traditional use.

Patients and health workers are in continuous communication. As a result, health workers play an important role in patient education. In spite of including workers who do not receive training related to health in health organizations in addition to those with health education, the personnel with training about RMDs is limited. Additionally, a literature scan found no study investigating the RMDs and ST knowledge levels among health workers. However, there are few studies among physicians and physiotherapists investigating the levels of knowledge about musculoskeletal diseases. Childs et al reported that physiotherapists' knowledge of managing musculoskeletal conditions was sufficient in their studies [19,20]. Grunfeld et al. reported that graduating medical students scored much higher than graduating physician assistant students [21]. This study emphasized that this may be because graduate physician assistant students are less likely to need specific physical examination and clinical skills necessary for diagnosis and management of musculoskeletal disease. A study including professional groups assessed RMDs knowledge levels of trainers and found knowledge levels about RMDs was above the mean [9]. Mostly these types of studies are performed on patient group or the public. In Turkey a study of rheumatoid arthritis patients measured the knowledge levels related to the disease among patients and emphasized that they had not received training about the disease.

The knowledge levels about rheumatoid arthritis (RA) of patients were found to be low [10,11]. Other studies frequently performed with RA patients found similar results and emphasized the importance of increasing awareness levels related to the disease among patients and society by organizing training programs [22–24]. Knowledge level studies related to rheumatic diseases in society identified knowledge levels. Again, the importance of education was emphasized and it was stated that early diagnosis and treatment would be more successful by increasing awareness [5,25].

In our study of 600 health workers, the questions answered about RMDs by doctors and physiotherapists receiving education about RMDs were similar and had high correct answer rates, while other professional groups had lower means, but similar rates of correct answers identified.

When the knowledge levels of those who consider ST effective or not effective are compared, though there was no statistically significant difference for RMDs knowledge levels, it appeared that those who saw ST as effective answered more questions correctly at statistically significant levels. Apart from doctors and physiotherapists, 51.53% of workers were identified to have RMDs themselves and/or in their family. While no statistically significant difference was identified between ST knowledge levels in these groups, there was a statistically significant difference between RMDs knowledge levels identified. Individuals with RMDs themselves or in their family had 5.84±2.29 question below the mean, individuals with only RMDs themselves had 7.80±2.33 questions and were identified to give highest rates of correct answers to 8.55±1.89 questions compared to those without RMDs themselves or in their family. Generally, though people without RMDs themselves or in their family may be considered not to need information, these rates reveal deficient knowledge of workers with disease themselves and/or in their family. When disease is encountered, increased knowledge requirements and research demands is an unavoidable natural process. Additionally, due to the internet, frequently used as a tool to access knowledge currently, though information appears to be easily accessed, pollution of knowledge was revealed to make it difficult to access accurate information. As health workers encounter more patients related to RMDs and ST, though not themselves or in their family, the need to give training is clear. The results of our study show that health workers have mistaken and deficient knowledge about these topics and reveal the importance of providing in-service training.

The most important limitation of our study is that the survey prepared by the researchers on this topic did not have validity and reliability studies performed.

## Conclusion

We found that even among the health workers who communicate with patients in hospitals, the level of knowledge with rheumatic diseases and spa treatments is very variable. Taking this into account, we believe that all personnel should be provided with supportive scientific information and training in order to ensure that the health workers who are intertwined with the health problems of the individuals reach the correct information. It can improve knowledge levels by targeting strategies to resolve false beliefs and information about the effectiveness of RMDs and ST in

health workers through future training programs.

## Competing interests

*The authors declare that they have no competing interests.*

## Financial Disclosure

*All authors declare no financial support.*

## Ethical approval

*Before the study, permissions were obtained from the local ethical committee.*

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