Rheumatoid Arthritis: Changing Patients' Perception toward Exercise and Level of Physical Activity

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Abstract:
Back ground: Rheumatoid Arthritis (RA) is an autoimmune disease leading to progressivedestruction and deformity of joint causingdifferent degrees of daily activitieslimitations. Exercise is a key component of non-pharmacological management, helps patients to maintain mobility and function. The current studyaimed to evaluate the change of rheumatoid arthritis patients' perception toward exercise and physical activity level. A quasi-experimental research design was used. Subjects: the sample consists of 100 rheumatoid arthritis patientsalong 6 months.Tools:Two tools were used for data collection;patient health relevant information sheet,it includes two main parts (1) Patient s' demographic data, and medical history. (2) Interview based questionnaire (to assess patients' knowledge about RA) and the arthritis impact measurement scales (aims2-sf). Results:There were a statistically significant higher knowledge score in follow up test (after 2-months) (87%±9.1%) compared to posttest (after 1-month) (79.7%±10.9%) and pre-test results (20.1%±20.9%) compared to control group.There wasstatistically significant improvement in physical functioning, affect, social interaction, role, and symptoms in study group compared to control group as score was not statistically significantly different at pretest (1.000) but highly statistically significantly different in posttest (after one months) (<0.0005) and follow-up (after two months) (<0.0005).Conclusion:The perception of the study group about exercise and physical activity improved significantly after health educational instruction implementation compared to the control.Recommendations:provide rheumatoid arthritis patients adequate knowledge and skills about exercise and physical activity to change their perception.
Keywords*: exercise, perception, physical activity level, rheumatoid arthritis.*

I. Introduction

Rheumatoid arthritis (RA), is one of rheumatic diseases of unknown causes which mainly affects joints, and resulting in chronic synovial inflammation that leads to erosive joint damage with marked failure and deformity, in addition to joint pain, swelling, tenderness and synovial jointsdestruction, leading to severe disability and premature mortality [1].Its worldwide prevalence is about 1% and it is constantly noticed that it affects women 2-3 times more than men and may start at any age [2]its occurrence is not the same throughout the world. It affects between 0.5% and 1% of the populationin England and Wales. The annual prevalence in the United States of America (USA) is 0.5 per 1,000 people per year and it's prevalence in Egypt and Saudi Arabia is 0.2-0.5%, respectively [3].

Exercise play an essential role in physical condition improvement and significantly reduces body weight, which will keep the patient at stable and healthy levels. The quality of life for people with rheumatoid arthritis can become better with exercise along with medications, a healthy diet and rest. Physical activitygoal is to develop and preserve strength with continuous and long-term engagement [4].Understanding of RA Patients' Perception regarding exercise is essential to the role of the health professional and has therefore received attention from previous research.Rheumatoid arthritis patients appear to gain benefit from long-term participation in exercise programs because it greatly improves muscle strength, decreases activity of diseaseand increases levels ofbone density. However, there are some patients who are unwilling to carry out an exercise program because they believe it can increase discomfort or more joint deterioration.Actually, the opposite is true because without exercise pain will gradually elevate, the course of movement of the joint will shrink, and a simple movement seems impossible for patients [4].

Significance of the Study

Understanding therheumatoid arthritis patients' perceptions regarding exercise is important to help in the initiation of and adherence to effective exercise training. It has been suggested that positive mental thinking regarding exercise may be necessary to challenge the long-term opinion that exercise exacerbates disease [5].

Aim of the Study:

The present study aimed to evaluate the change of rheumatoid arthritis patients' perception toward exercise and physical activity level.

Research hypothesis:

(1)There would be significance difference between level of rheumatoid arthritis patients' knowledge pre and post instructions.

(2) Educational instructions would have a positive effect on rheumatoid arthritis patients' perception toward exercise and physical activity level.

II. Subjects & Methods

Research design:

A Quasi-experimental research design was used to carry out this study.

Setting:

The study was conducted at Mansoura University hospitals in Rheumatology Outpatients clinics, Egypt.

Subjects:

A purposive sample of all available number of RA patients from both sexes during a period of six months (100) were included in this study. The total study sample was assigned randomly to two equal groups,a study groupwho had the routine hospital care and health educational instructions and control group whohad the routine hospital care only.

Tools for data collection:

The data of this study were collected using the following tools:

Tool I: A structured questionnaire sheet, it will be performed by the researcher, written in simple Arabic language, and divided into the following two parts**:**

Part I: The Socio-demographic data and medical data sheet which consisted of (13) questions such as patient`s age, sex, education, marital status, residence, history ofjoint surgery, autoimmune disease and other chronic diseases.

Part II: Interview based questionnairewhich consisted of (22) questions including; general knowledge related to rheumatoid arthritis,knowledge related to exercise and benefits of physical activity to prevent complication.

Tool II: The arthritis impact measurement scales (aims2-sf):It is a self-reported questionnaire composed of 12 scales to evaluate five components of health status in rheumatoid arthritis patients: affect (5 items), physical (12 items), social interaction (4 items) and role (2 items), and symptom (3 items) components. The questions are answered with options starting from "all days" to "no days" in the previous month.

Operational Design

This designconsists of preparatory phase, ethical considerations, validity and reliability, pilot study, and fieldwork.

Preparatory phase:

Extensive review of the current national and international literatures related to the research title was done using textbooks, articles and magazines. Implementing this study required the development of two tools for changing the perception of rheumatoid arthritis patients toward exercise and level of physical activity. The pre health educational instructions developed in the form of booklet after reviewing related literatures.it consisted of; overview of rheumatoid arthritis, the importance of exercise, types of some exercises and instructions related to exercise.

Ethical consideration:

The agreement was takenfrom each participant after the aim of the study is explained to them. They were notified that they can withdraw at any stage of the research. Every participant was provided with an explanatory form on the study which includes the purpose of the study, confidentiality of information, and some instructions. All ethical issues were taken into consideration during all phases of the study.

Validity and Reliability

All tools of data collection were examined for validity by a panel of 5 experts in the medical surgical nursing specialty from Faculty of Nursing and Faculty of Medicine at Mansoura University.All suggestions

andcomments were considered and rewording. The reliability of the study tools was tested byCronbach's coefficient Alpha for all tools (r =0.865)**.**

Pilot study

The pilot study was conducted on 10% of patients with rheumatoid arthritis selected from Rheumatology department in Mansoura University Hospitals to examine the applicabilityand the clarity of the tools. These patients were not included in the study sample. Tools were modified according to the results of pilot sample to be clear and understood.

Field Work

The actual field work started and continued for period of 6 months starting from June 2018 to December 2018(for all phases). The study extends over three stages: The first is the preparatory stage which including the development of tools, pilot study, validation and reliability. In addition to obtaining formal permit, an official letter issued by director of Nursing Faculty of Mansoura University to the director of Mansoura University Hospitals to obtain approval to conduct this study. The second stage including the study subjects'selection, who have met the inclusion and exclusion criteria, with their agreement for their participation in the study after explanation of the purpose of the study, the assessment of the pre-test, and the application of guidelines for the study group. The third stage including post-test evaluation (for both groups) and put the finishing touches to the research (data analysis, discussion, and so on).

Implementation phase:

The developed exercise instructions for the study group were implemented individually. It was conducted in 2 sessions; the education session took about 30 minutes and the training session took about 45 minutes (according to the activities required in each session and attention span of the patients).The researcher began the first session of the educational instructions for patients in the study group, provided information that was needed. Demonstration and re-demonstration many times until doing without error. During each knowledge session the researcher used simple, brief and clear words.At the end of each session, a brief summary was given by the researcher. Moreover, the instructional booklet was given to each patient in the study group to get their attention and motivation, and help for reviewing at home and support teaching and practice at home. After one month during follow up the researcher meet patients in the study group to check with them their adherence to the instructions. Problems and concerns in performing the exercise training were discussed. Then after two months patients came to outpatient clinics for follow up, the researcher meet them to check their improvement after performing the health educational instructions.

Evaluation:

Patient's knowledge and performance of exercise instructions were evaluated before and after the implementation of the instructions to identify differences and improvement for each group. The results of both groups were compared to evaluate the effect of the health educational instructions on changing perception of rheumatoid arthritis patients.

Statistical analysis:

The data was entered and analyzed using statistical software IBM SPSS version 20. All statistical analysis were performed by tailed tests and alpha error of 0.05. P value was considered less than or equal to 0.05 to be statistically significant. Regarding scoring system, the items discrete scores for each scale (knowledge or practice) were summarized together, then the sum of the scores for each dimension and the sum of the subjects and method 37 was calculated by summing the scores given to his answers. All grades have been converted into categories.

III. Result

Table (1) Showed distribution of studied groups according to their socio demographic characteristics. More than half of study group (58.0%) aged 30 - 40 whereas more than half of control group (56.0%) aged 40 – 50 with mean age was 21.12 ± 6.1 years and 24.23 ± 3.1 years for study and control group respectively. Mostly were female (90% and 82% of study and control group respectively), regarding residency 80% of study group and 70% of control group from rural areas, in relation to marital status about three fourth (72%) of study group and two thirds (60%) of control group were married. Illiteracy was prevailing among 32.0% of both groups. Regarding working status about two thirds of study group (66.0%) and more than half of control group (52.0%) were unemployed.

Figure (1) comparison between the studied groups according to their mean knowledge score through the study period. It can be noticed that, there were a statistically significant higher knowledge score in follow up

test (after 2-months) (87%±9.1%) compared to posttest (after 1-month) (79.7%±10.9%) and pre-test results (20.1%±20.9%) compared to control group.

Figure (2): This figure summarizes that, Total knowledge score among rheumatoid arthritis patients. About two third of the study group 63% had good knowledge compared to 17% of control group. This figure also portrays that, the knowledge of the study group about rheumatoid arthritis and exercise improved significantly after health educational instruction implementation. As well as there was no improvement of the knowledge of the control group.

Figure (3) shows comparison between studied groups according to their physical, affect, social, role, and symptoms related improvement using Arthritis Impact Measurement Scales (AIMS2) after two months. It appears clearly that, statistically significant improvement in physical functioning, affect, social interaction, role, and symptoms in study group compared to control group (<0.0005) after two months.

Table (2) demonstrates the Correlation between demographic characteristics and total knowledge score from baseline to 2nd month. The findings of the present study revealed that there were a significant correlation between patients' age, work status, residency, and educational level and mean knowledge score (P=0.0005, 0.0005 and 0.012) respectively.

Table (3) demonstrates the Correlation between rheumatoid arthritis patients' improvement (AIMS2) and total knowledge score from baseline to 2nd month. Concerning study group, the findings of the present study revealed that there was a significant correlation between patients' physical, psychological, social interaction, role, and symptoms related improvement and total knowledge score by the end of the study (P=0.0005) compared to control group.

Table (1) *Showed* Distribution of studied groups according to their socio demographic characteristics (baseline)

Variable	Group				χ2	P value
	Study (n=50)		Control(n=50)			
	N	%	N	%		
Sex Male Female	5 45	10% 90%	9 41	18.0% 82.0%	1.329	0.249
Age 20-29 30 - 39 40 - 49 50 -60	5 29 1 15	10% 58.0% 2.0% 30.0%	2 10 28 10	4.0% 20.0% 56.0% 20.0%	36.680	<0.0005*
Mean ± SD	21.12 ± 6.1		24.23 ± 3.1			
Marital status Single Married Separated Widow	2 36 3 9	4.0% 72.0% 6.0% 18.0%	2 30 6 12	4.0% 60.0% 12.0% 24.0%	1.974	0.601
Residency Rural Urban	40 10	80.0% 20.0%	35 15	70.0% 30.0%	1.333	0.248
Education level Illiterate Read and write Pre-university University	16 9 15 10	32.0% 18.0% 30.0% 20.0%	16 16 8 10	32.0% 32.0% 16.0% 20.0%	4.090	0.252
Working status Working Unemployed	17 33	34.0% 66.0%	24 26	48.0% 52.0%	2.026	0.155

X²: Chi-square test   **^ P value based on *Fisher's Exact Test**   **** P < 0.05 (significant)**
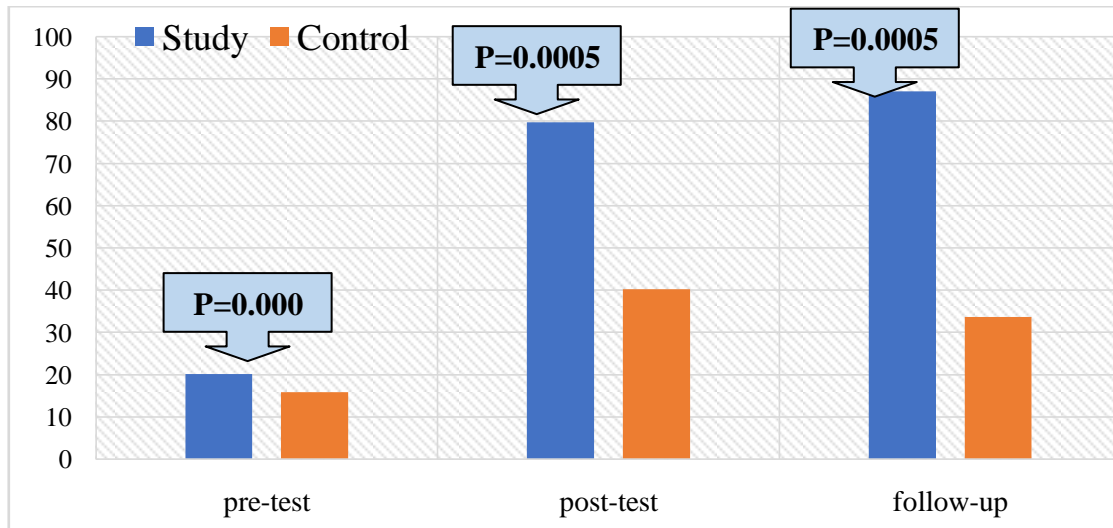
P value by Repeated measures ANOVA

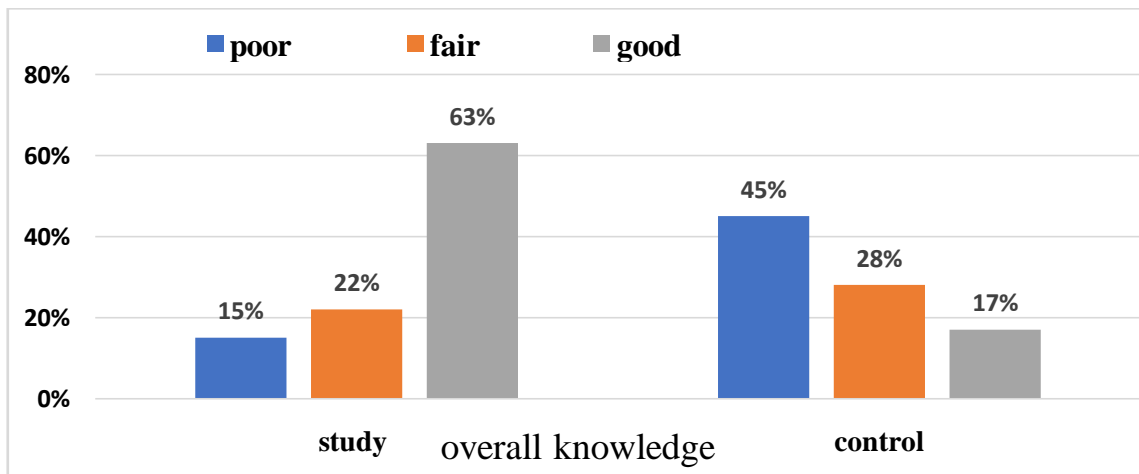*Figure (1):* **Distribution of the studied groups according to mean knowledge score**

Figure (2): Total knowledge score among rheumatoid arthritis patients

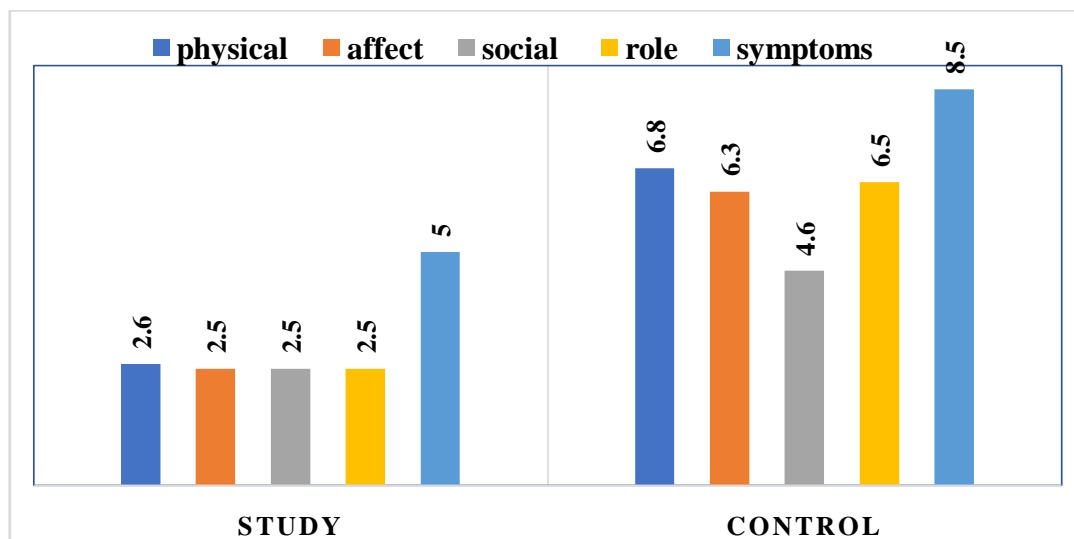**Good: ≥ 75 %   Fair: 50 % - 75 %   Poor: < 50%**

Figure (3): Comparison between studied groups according to their physical, affect, social, role, and symptoms related improvement using Arthritis Impact Measurement Scales (AIMS2) after 2 months.

Table (2): **Correlation between demographic characteristics and total knowledge score through study period**

variables		age		Working status		Residency		Education level	
		r	p	r	p	r	p	r	p
Total knowledge score	Pre-test	-0.417	**0.003***	0.372	**0.028***	0.481	**0.0005***	0.737	**0.0005***
	Post-test	-0.441	**0.001***	0.361	**0.010***	0.542	**0.0005***	0.647	**0.0005***
	Follow-up	-0.293	**0.008***	0.072	0.617	0.212	**0.045***	0.354	**0.012***

R: Pearson's correlation coefficient.   **P: value by Pearson's correlation test.**

Table (3): Correlation between rheumatoid arthritis patients' improvement (AIMS2) and total knowledge score from baseline to 2nd month

Variable		Study			Control		
		TKS-Baseline	TKS-1Month	TKS-2Months	TKS-Baseline	TKS-1Month	TKS-2Months
*physical	r	-	0.611*	0.251	-	0.273	0.268
	p		**0.0005***	**0.058***		**0.055***	(0.060)
*psychological	r	0.611	0.630	0.498	0.273	-	0.630
	p	**0.0005***	**0.0005***	**0.0005***	(0.055)		(<0.0005)
* Social interaction	r	0.251	0.498	0.273	0.268	0.630	-
	p	**0.058***	**0.0005***	**0.055***	(0.060)	**0.0005***	
Role (work)	r	0.498	0.273	0.268	-	0.611	0.251
	p	**0.0005***	**0.055***	**0.040***		**0.0005***	(0.078)
Symptoms (arthritis pain)	r	-	0.268	0.630	0.611	-	0.251
	p		**0.040***	**0.0005***	**0.0005***		(0.078)

Data are presented as correlation coefficient (p value). P value was produced by *Pearson's correlation,

IV. Discussion

Regarding socio-demographic characteristics of the participants, the findings of the present study represented that, RA affect females more than males. These results are in agreement with **Nourisson, Soubrier and Mulliez (2017) and Berner, et al. 2018** who stated that, gender differences are seen in biologic (hormones) or behavioral factors (smoking), which influence susceptibility and phenotype of RA[6], [7]. These results also agree with **Horiuchi, Pereira, Kahlow, Silva and Skare (2017)** which found that males are more affected in older age groups, and this fact is already widely recognized and shows that the incidence of rheumatoid arthritis in men gradually increases with age, while in women it increases from 45 years, reaching a plateau in 75 years, from which the incidence starts to decline[8].

In relation to age, the findings of the present study represented that, the majority of both group were between third decades to less than fifth decade of age, which agreed with the finding of the study of **Metwaly, Taha, Seliem and Sakr (2017)** who stated that the main age of rheumatoid arthritis in Egypt was 45 years [9]. Our result disagree with the result by **Abo Elnoor, Abbas, Salim and El Hakeem (2018)**, who observed that although RA hazard increases with age, it can show at any stage of life, counting childhood, youth, and adulthood. This may attributes to RA is a chronic disease with an age-related incidence. It is present in all ethnic populations and at all ages [10].

Concerning general knowledge of patients, majority of patients in both groups had low knowledge level in pre -test, while post tests showed that majority of control group did not exhibit any improvement in their knowledge, whereas two third of patients in study group had improved knowledge score, one third of them had fair general knowledge and quarter of them had poor general knowledge, which indicated remarkable increasing in general knowledge comparing to control group. In this respect study of **Salman, SAlnuaimi, Lateef, and Kadhum (2014)** agree with the current study as it stated that formal patient's education sessions may enhance the patients' awareness of RA and exercise, and might achieve better results in reducing the disease severity [11]. In the same line of the present study results of **Ndosi and Adebajo (2015)** indicated that patient education (PE) for people with chronic diseases like rheumatoid arthritis are extremely important, as this allows them to adapt and cope with the effects of the disease and treatment. [12].

As regards to the effect of the proposed educational instructions on the practice of exercise and physical activity in first meeting using (AIMS2), the result showed that no statistically significant difference

between the studied groups with respect to the mean result for all aspects of good health condition (Physical, Affect, Social interaction, Role, symptom) before the intervention. According to **Metsios, Stavropoulos-Kalinoglou and Kitas (2015)** in the Second meeting after applying educational instructions for RA patients, the mean score increased and such increase was statistically significant in all dimensions of health [13]. The study results agreed with the results obtained by **Jahanbin, et al. 2014** who showed that one of the key roles of rheumatology health-care professionals is to promote exercise and the maintenance of an active lifestyle, thus maximizing quality of life and functional ability [14]. Also, **Vermaak, Briffa, Langlands, Inderjeeth and McQuade (2015)** agreed with findings of the present study as they indicated that a reduction in disability and pain, and an increase in knowledge, joint protection, and the carrying out of exercise after the application of an educational intervention should be integrated in the treatment of RA [15].

Regarding relation between total knowledge level and socio-demographic characteristic, there were a significant correlation between patients' age, work status, residency, and educational level and mean knowledge score through the study period which disagree with results of **Salman, SAlnuaimi, Lateef and Kadhum (2014)**who stated that Age, gender, educational level, disease duration, activity and severity in addition to count of hospital admissions had no important relations with knowledge or attitude towards RA [11]. On the other hand our study results agreed with results obtained by study of **Bozbaş and Gürer (2018)** as the authors pointed out that the level of patient's knowledge decreased with age and it was positively influenced by education level, socioeconomic status and present of RA disease in family [16]. Also, **Sierakowska, et al. 2016** agreed with findings of the present study as they indicated that the level of knowledge was positively influenced by education level, socioeconomic status so, patient knowledge increased as educational level increased [17]. In addition, the study of **Da Mota, et al. 2012** revealed that education for people living with chronic diseases such as RA is extremely important as it has a range of benefits such as improved disease knowledge, self-efficacy, concordance with treatment and physical and psychological health status. [18].

On studying the relation between rheumatoid arthritis patients' improvement (AIMS2) and total knowledge score from baseline to 2nd month. The currents findings suggested that there was a significant correlation between study group total knowledge score levels and their physical, psychological, social interaction, role, and symptoms related improvement by the end of the study. In the same line of the present study results of the study by **Ndosi, et al, 2016** reported that Self- efficiency is vital for patients with rheumatoid arthritis who are expected to take on self-management activities and cohere to different intervention therapies In addition to their family and work roles. In chronic diseases, self-efficacy has been demonstrated to mediate the effects of education on other outcomes such as pain, physical health, mental health, and health-related quality of life. This is likely to explain the improvement in AIMS2. [19].

V. Conclusion
Based on the present study findings, it can be concluded that providing sitirhtra diotamuehr patients with health educational instructionsimproved level of patients' knowledge and enhanced their practice of exercise and physical activity.

VI. Recommendations
Availability of health educational instructions with Arabic version for all rheumatoid arthritis patients to provide all needed information.Patient's knowledge should be assessed by nurses constantly and progressively and supplies them with needed knowledge. Continuous educational program for nurses about the importance of exercise and physical activity related to RA help in increasing patients' knowledge and skills.

Acknowledgments

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