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Effect Of Nurse Led Interventions On Knowledge Of Patients With Rheumatoid Arthritis.

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Abstract

Background : Arthritis affects one or multiple joints characterized by inflammation, pain and stiffness. Two most common types of arthritis are osteoarthritis and rheumatoid arthritis. Osteoarthritis is a degenerative disease of the joints Rheumatoid Arthritis is an autoimmune disease causing inflammation in the joints**.** Objective of the study was to evaluate the effect of nurse led interventions on knowledge of patients with Rheumatoid Arthritis.

Methods: Quasi-experimental non-equivalent time series design was used in the study.

The sample consisted of 106 patients who are diagnosed as Rheumatoid Arthritis who are recruited by purposive sampling technique.

Results: There was statistically significant difference in the mean pre-test and post-tests scores of knowledge among patients with rheumatoid arthritis in the intervention group ($p < 0.001$)

Conclusions: Study concluded that the nurse led interventions were effective in enhancing the knowledge of patients with Rheumatoid arthritis.

Keywords: Effect, Nurse led interventions, Knowledge and Rheumatoid arthritis

I. INTRODUCTION

Rheumatoid Arthritis affects the synovial joints. Main synovial joints of the limbs are shoulder joint, elbow joint, wrist joints, joints of the hands and fingers, hip joint, knee joint, ankle joint, joints of the foot and toes. The predisposing factors are sex, age, family history, environmental factors, smoking and stress. Rheumatoid Arthritis has several "hallmark" symptoms – when the disease first presents itself. These include Morning stiffness lasting longer than 30 minutes, pain and/or inflammation in the same joint on both sides of the body, pain in three or more joints at the same time, loss of motion in affected joints and severe fatigue.[1] Treatment of Rheumatoid Arthritis is multi-disciplinary involving medications, regular follow-up, physiotherapy, joint protection, self-management and psychosocial support.[2]

Worldwide, the annual incidence of Rheumatoid Arthritis is approximately 3 cases per 10,000 populations, and the prevalence rate is approximately 1%, increasing with age and peaking between the ages of 35 and 50 years. Experts predict the number of patients with Rheumatoid Arthritis may double by 2030.[3]

Rheumatoid Arthritis has been a neglected subspecialty in India.Trained rheumatology specialists are inadequate comparing to the number of patients, the cost of treatment is also high, so most of the patients rely on complementary and alternative medicines in India[4]. Arthritis affects more than 180 million people in India,.[5] More recently, the government has provided some financial support for medical expenses through various schemes, but there is not much support in terms of disability or unemployment. Many patients struggle to meet the financial burden of long-term chronic disease, leading to despair.[6]

Only few Rheumatoid Arthritis studies are done in Kerala and are mainly by the Complimentary Therapy Departments. In a prevalence study, the population of the Ottoor village of Kerala was surveyed after an epidemic of Chikungunya virus to assess Rheumatic- Musculoskeletal (RMSK) pain. In this village, the prevalence of RMSK pain was 1.4% among 437 individuals (mean age: 48 years). As per the documents an

average of 140 to 160 Rheumatoid Arthritis clients attends the Rheumatology clinic of Government Medical College, Kozhikode weekly. Most of these clients are from three North East districts of Kerala.

People with Rheumatoid Arthritis may avoid exercise because of joint pain, risking weight gain and placing extra strain on the heart.[7] Arthritis self-management education programs have been reported to reduce pain, disability and health care costs.[8] The primary focus of these activities includes acquisition of information, skills, beliefs and attitudes which has impact on health status, quality of life, and possibly health care utilization.[9] The knowledge of patients with Rheumatoid Arthritis is very important for the patient to comply with the treatment, to change behaviors and thus to prevent disability[10].

Collaboration between the client and entire health team especially nurses is necessary for teaching and reinforcing the unpredictable nature of the disease. Ability to engage in health care behavior largely depends on the knowledge of patient regarding the disease, treatment, and the motivation to engage in healthy behaviour. Hence the role of the nurse in leading specific educational program to enhance the knowledge of patients with Rheumatoid Arthritis is significant

A cross-sectional study done to determine the level of disease awareness among patients with Rheumatoid Arthritis using a self-made questionnaire have shown that only 3(1.5%) patients were aware; 48(25%) were partially aware; and 149(74.5%) were unaware.[11]Another cross-sectional study was done to assess the patients' knowledge about the disease, treatment, complications, and severity in a sample of 100 patients revealed that about 76% of the cases had poor knowledge about the disease. Most patients had a high disease activity index, and there was no correlation between patients' educational level and the disease activity.[12]

II Material and methods

Study design population, sampling technique and sample size

Quasi-experimental non-equivalent time series design was used in the study. The study was carried out among Rheumatoid Arthritis patients who are attending the Rheumatology clinic of new Medical College Hospital,Kozhikode.The data collection was done from 5th July, 2019 to 28th February, 2020.Sampling technique used was purposive,a total of 106 patients were selected for the study.

Criteria of sample selection

Inclusion criteria

Patients who are diagnosed with Rheumatoid Arthritis with a duration of diagnosis of less than 15 years,in the age group of 35 - 70 years ,willing to attend the demonstration of exercise for Rheumatoid Arthritis and to come for follow up and who are able to read and write Malayalam and English .

Exclusion criteria

Patients who have joint deformities,osteoarthritis,psychiatric illness,systemic complications like pleurisy, pneumonitis, pulmonary hypertension, pericarditis, myocarditis, iritis, scleritis and Sjogren's syndrome.

Data collection instruments

Two tools were used for data collection

Tool-1**:** A semi-structured interview schedule to collect socio-demographic and clinical data.It consisted of two sections.The first section comprised of 14 items to collect socio-demographic data including patient's age, sex, religion, educational status, type of family, role in the family, economic status, support system etc and the second with 21 items to collect clinical data such as family history of Rheumatoid Arthritis, duration of diagnosis, joint problems, exercise habits, adoption of joint protection strategies and blood values.

Tool-2- Rheumatoid Arthritis Awareness Questionnaire

This tool assessed the knowledge regarding Rheumatoid Arthritis and self-care management. It was a self - administered questionnaire with 8 sections.

Scoring and Interpretation

Each correct response was given score 1 and 0 score for wrong responses. The maximum score was 50. Knowledge Score was categorized as Poor (0-15), Moderate (16-30), Good (31-50)

Reliability

The reliability of the instrument was 0.841 and was good.

Description of the Interventions

Arthritis information course developed by the researcher was used for teaching the patients with Rheumatoid Arthritis. The intervention included Planned group teaching programme of 30 minutes duration on Rheumatoid Arthritis, structure of a joint, Arthritis-an overview, Arthritis-Basic facts, clinical features, diagnostic tests, treatment, nonpharmacologic interventions and self-care management in Rheumatoid Arthritis. Self-care management topics included measures to control pain and joint stiffness, measures to protect joint, measures to control fatigue, measures to control depression, measures to promote rest and sleep, measures to control stress and dietary management in Rheumatoid Arthritis in the rheumatology

clinic. The researcher used lecture cum discussion for teaching the subjects. Posters and Flipcharts were used as audio visual aids. The content validity of the Arthritis information course was obtained from 8 experts. The content was translated to Malayalam and obtained translation and retranslation validity.

Data collection procedure.

Administrative permission was obtained from the Medical Superintendent, Principal, Government Medical College,Kozhikode as per order number E2/3761/2019 Dated 28/02/2019. A pilot study was conducted from 21st March, 2019 to 22nd June, The study design, intervention and data collection plan were found to be feasible and practical.The period of data collection for main study was from 5th July, 2019 to 28th February, 2020. A purposive sampling technique was used.Subjects who were attending the Rheumatology clinic of NMCH, Kozhikode,fulfilling the inclusion criteria were approached for obtaining a written consent after giving an adequate explanation about the study. Confidentiality was also assured.The eligible patients attending the Rheumatology clinic on 1st and 3rd Friday were allotted to intervention group and those on 2nd and 4th Friday to control group to avoid contamination. The intervention group received Nurse Led Interventions and routine care and those in the control group received routine care alone. The patients came for follow up once in 4 weeks, so the follow ups were done on 4, 8 and 12 weeks after the intervention

Hypothesis

H_1 : There is a significant difference in the level of knowledge of patients with Rheumatoid Arthritis in the experimental and the control group after the nurse led interventions.

Statistical analysis

Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS, version 16). The statistical tests, both Descriptive and Inferential, were used for analyzing the data. The descriptive statistics used were mean, standard deviation, and percentage. Inferential statistics such as chi-square test, paired 't' test, student 't' test, ANOVA repeated measures test and Bonferroni 't' test were used for data analysis.

III. RESULTS AND DISCUSSION

Student 't' test, ANOVA repeated measures test and Bonferroni 't' test were used for data analysis.

RESULTS

Table - 1
Distribution of Selected Socio Demographic Variables of Subjects with Rheumatoid Arthritis

(N = 106)

Demographic Variables	Sub-Variables	Experimental Group (n = 54)		Control Group (n = 52)		Chi-square test value	df	P value
		No.	%	No.	%			
Age (in years)	≤40	10	18.5	6	11.5	3.869	3	0.276
	41-50	20	37.0	18	14.6			
	51-60	12	22.2	20	38.5			
	>60	12	22.2	8	15.4			
Gender	Male	8	14.8	3	5.8	2.331	1	0.202
	Female	46	85.2	49	94.2			
Religion	Hindu	23	42.6	24	46.2	1.784	2	0.410
	Islam	27	50.0	27	51.9			
	Christian	4	7.4	1	1.9			
Educational Status	Primary School	25	46.3	24	46.2	4.898	4	0.298
	High School	22	40.7	20	38.5			
	College	3	5.6	-	-			
	Technical / Professional	-	-	1	1.9			

Demographic Variables	Sub-Variables	Experimental Group (n = 54)		Control Group (n = 52)		Chi-square test value	df	P value
		No.	%	No.	%			
	No Formal Education	4	7.4	7	13.5			
Marital Status	Married	45	83.3	40	76.9	3.617	3	0.306
	Unmarried	4	7.4	2	3.8			
	Widow/Widower	5	9.3	8	15.4			
	Divorced	-	-	2	3.8			
Type of Family	Nuclear	32	59.3	34	65.4	1.664	2	0.435
	Joint	22	40.7	17	32.7			
	Extended	-	-	1	1.9			
Roles in the Family	Spouse	41	75.9	36	69.2	4.337	3	0.631
	Parent	26	48.2	29	55.8			
	Grandparent	4	7.4	6	11.5			
	Others	4	7.4	2	3.8			
Number of Family Members	1 – 3	11	20.4	11	21.2	4.113	2	0.942
	4 – 6	34	63.0	36	69.2			
	>6	9	16.6	5	9.6			
Occupation	Housewife	43	79.6	47	90.4	5.533	2	0.137
	Coolie	8	14.8	5	9.6			
	Agriculture	3	5.6	-	-			
Economic Status (Per year)	Rs. >27,000	16	29.6	19	36.5	1.760	1	0.624
	Rs. <27,000	38	70.4	33	63.5			
Predominant Support System	Family	49	90.7	43	82.7	9.023	5	0.108
	Friends	-	-	1	1.9			
	Relatives	-	-	6	11.5			
	Family and Relatives	2	3.7	1	1.9			
	Family, Friends and Relatives	1	1.9	-	-			
	Others	2	3.7	1	1.9			

Table 1 shows that most of the subjects 46 (85.2%) in the intervention group and 49(94.2%) control group were females. Half of the subjects in the intervention group 27(50.0%) and in the control group 27(51.9%) were Islam. Distribution of subjects according to predominant support system revealed that 49(90.7%) subjects in the intervention group and 43(82.7%) in the control group had family as the major support system.The chi-square values obtained were not significant (P>0.05) indicated that, both the groups were similar and comparable with regard to socio-demographic variables

Table - 2
Distribution of Selected Clinical Variables of Subjects with Rheumatoid Arthritis

(N = 106)

Clinical Variables	Sub-Variables	Intervention Group (n = 54)		Control Group (n = 52)		Chi-square test value	df	P value
		No.	%	No.	%			
Age of Onset (in years)	<40	19	35.2	18	34.6	0.017	2	0.982
	41-50	24	44.4	24	46.2			
	>50	11	20.4	10	19.2			
Family History	Yes	7	13.0	7	13.5	0.006	1	0.940
	No	47	87.0	45	86.5			
Habit of Smoking	Yes	3	5.6	2	3.8	0.172	1	0.678
	No	51	94.4	50	96.2			
Habit of Exercise Regularly	Yes	12	22.2	14	26.9	0.316	1	0.574
	No	42	77.8	38	73.1			
Daily Hours of Sleep During Night	0 – 4	7	13.0	10	19.2	6.866	2	0.651
	5 – 7	36	66.7	29	55.8			
	> 7	11	20.4	13	25.0			

Table 2 shows that the age of onset was at 41-50 years for 24(44.4%) subjects in the intervention group and 24(46.2%) subjects in the control group and 47(87%) subjects in the intervention group and 45(86.5%) subjects in the control group did not have family history of Rheumatoid Arthritis.Most of the subjects 51(94.4%) in the intervention group and 50(96.2%) in the control group were nonsmokers. Majority 42(77.8%) subjects in the intervention group and 38(73.1%) subjects in the control group were not doing exercise. The chi-square values obtained were not significant (P>0.05) indicating that, both the groups were similar and comparable.

Table – 3
Mean and Standard Deviation of Knowledge of Subjects in the Experimental Group and Control Group at Pretest

(N = 106)

Pretest Score	Group				Mean difference	Student Independent t test
	Experimental (n = 54)		Control (n = 52)			
	Mean	SD	Mean	SD		
Knowledge	9.22	5.90	7.88	4.31	1.34	t = 1.328 P = 0.187

Table 3 shows that the mean difference of knowledge score was 1.34 and was not statistically significant. (P= 0.187)

Table 4 depicts the area wise knowledge scores. Both groups had maximum knowledge in the area ‘arthritis an overview’2.54(36.3%) and 2.48 (35.4 %) during pretest followed by ‘investigation’ in the experimental group 0.93(31%) and ‘Anatomy and Physiology’ in the control group 0.62(31%).Both the groups had least knowledge in the area ‘Treatment’ during pretest with a score range of 0.54(5.4%) for experimental group and 0.21(2.1%) in the control group .The non-significant p values indicate that the groups were similar and comparable.

Table - 4
Mean and Standard Deviation of Knowledge of Subjects in Sub Areas of Rheumatoid Arthritis in the Experimental Group and Control Group at Pretest
(N = 106)

Knowledge score Sub-Area	Experimental Group (n = 54)			Control Group (n = 52)			Mean difference	Student Independent 't' test
	Mean	SD	Mean (%)	Mean	SD	Mean (%)		
Anatomy and Physiology of Joints	0.57	0.54	28.5	0.62	0.63	31.0	0.04	t = 0.364 p = 0.717
Arthritis an Overview	2.54	1.63	36.3	2.48	1.41	35.4	0.06	t = 0.190 p = 0.850
Meaning and Risk Factors	1.17	1.18	19.5	0.75	0.74	12.5	0.42	**t = 2.173** **p = 0.032***
Signs and Symptoms	1.39	1.17	23.2	1.15	1.07	19.2	0.24	t = 0.075 p = 0.285
Investigation for Identifying Rheumatoid Arthritis	0.93	0.87	31.0	0.60	0.80	20.0	0.33	**t = 2.037** **p = 0.044***
Treatment	0.54	1.00	5.4	0.21	0.41	2.1	0.33	**t = 2.168** **p = 0.032***
Self-Care Management	2.07	2.50	12.9	2.08	2.35	13.0	0.01	t = 0.006 p = 0.995

* Significant

Table - 5
Comparison of Level of Knowledge of Subjects in the Experimental Group and Control Group during Pretest, Posttest - I, Posttest - II and Posttest – III

(N = 106)

Assessment	Level of Knowledge	Groups				Chi-square value	P value
		Experimental Group (n=54)		Control Group (n=52)			
		No.	%	No.	%		
Pretest	Poor	46	85.2	49	94.2	2.331	p= 0.127 df=1
	Moderate	8	14.8	3	5.8		
	Good	-	-	-	-		
Posttest – I (4 weeks)	Poor	3	5.6	49	94.2	84.018	**p<0.001***** **df=2**
	Moderate	24	44.4	3	5.8		
	Good	27	50	-	-		
Posttest – II (8 weeks)	Poor	5	9.3	50	96.2	80.280	**p<0.001***** **df=2**
	Moderate	32	59.3	2	3.8		
	Good	17	31.5	-	-		
Posttest – III	Poor	3	5.6	47	90.4	77.740	**p<0.001*****

(12 weeks)	Moderate	28	51.9	5	9.6		**df=2**
	Good	23	42.6	-	-		

***** Highly Significant**

Table 5 shows that in pretest there was no significant difference between the subjects in the experimental group and control group in the level of knowledge(P=0.127). But at posttest I, posttest II and posttest III, there is a significant difference between both groups(p<0.001) in terms of knowledge. Hence, it is inferred that the Nurse Led Intervention were effective in enhancing the knowledge.

Table – 6

Mean and Standard Deviation of Knowledge of Subjects in Various Sub Areas in the Experimental Group and Control Group during Pretest, Posttest - I, Posttest-II and Posttest - III

(N = 106)

Area		Experimental Group (n = 54)			Control Group (n = 52)			Mean differ-ence	Student Independent 't' test
		Mean	SD	Mean (%)	Mean	SD	Mean (%)		
Anatomy and Physiology of Joints	Pretest	0.57	0.54	28.5	0.62	0.63	31.0	0.04	t= 0.364 p = 0.717
	Posttest I	1.19	1.13	59.5	0.62	0.63	31.0	0.57	**t= 5.419 p< 0.001*****
	Posttest II	1.13	0.39	56.5	0.62	0.63	31.0	0.51	**t= 5.065 p<0.001*****
	Posttest III	1.22	0.46	61.0	0.65	0.59	32.5	0.57	**t= 5.530 p <0.001*****
Arthritis an Overview	Pretest	2.54	1.63	36.3	2.48	1.41	35.4	0.06	t= 0.190 p = 0.850
	Posttest I	5.31	1.61	75.9	2.50	1.41	35.7	2.81	**t= 9.564 p <0.001*****
	Posttest II	4.94	1.56	70.6	2.87	1.51	41.0	2.08	**t= 6.973 p <0.001*****
	Posttest III	5.04	1.35	72.0	3.15	1.51	45.0	1.88	**t= 6.778 p <0.001*****
Meaning and Risk Factors	Pretest	1.17	1.18	19.5	0.75	0.74	12.5	0.42	**t= 2.173 p = 0.032***
	Posttest I	3.19	1.44	53.2	0.75	0.74	12.5	2.44	**t= 0.10.885 p <0.001*****
	Posttest II	2.85	1.27	47.5	0.69	0.73	11.5	2.16	**t= 10.716 p <0.001*****
	Posttest III	3.15	1.25	52.5	0.77	0.76	12.8	1.38	**t= 11.796 p <0.001*****
Signs and Symptoms	Pretest	1.39	1.17	23.2	1.15	1.07	19.2	0.24	t= 1.075 p = 0.285
	Posttest I	3.48	1.21	58.0	1.13	1.07	18.8	2.35	**t= 10.581 p <0.001*****

	Posttest II	3.09	1.19	51.5	1.13	1.09	18.8	1.80	**t= 8.144 p <0.001*** **
	Posttest III	3.57	1.27	59.5	1.46	1.06	24.3	2.11	**t= 9.301 p <0.001*** **
Investigation for Identifying Rheumatoid	Pretest	0.93	0.87	31.0	0.60	0.80	20.0	0.33	**t= 2.037 p = 0.044***
	Posttest I	1.93	0.70	64.3	0.60	0.80	20.0	1.33	**t= 9.147 p <0.001*** **
	Posttest II	1.85	0.76	61.7	0.75	0.86	25.0	1.10	**t= 6.984 p <0.001*** **
	Posttest III	1.93	0.80	64.3	0.81	0.86	27.0	1.1	**t= 6.928 p <0.001*** **
Treatment	Pretest	0.54	1.00	5.4	0.21	0.41	2.1	0.33	**t= 2.168 p =0.032***
	Posttest I	4.13	2.06	41.3	0.21	0.41	2.1	3.91	**t= 13.480 p <0.001*** **
	Posttest II	3.57	1.92	35.7	0.19	0.40	1.9	3.38	**t= 12.450 p <0.001*** **
	Posttest III	5.09	2.16	50.9	0.23	0.43	2.3	4.86	**t= 15.957 p <0.001*** **
Self-Care Management	Pretest	2.07	2.50	12.9	2.08	2.35	13.0	0.01	t= 0.006 p = 0.995
	Posttest I	9.59	3.22	59.9	2.08	2.35	13.0	7.52	**t= 13.687 p <0.001*** **
	Posttest II	9.07	2.74	56.7	2.12	2.31	13.3	6.96	**t= 14.121 p <0.001*** **
	Posttest III	9.04	2.75	56.5	2.27	2.37	14.2	6.77	**t= 13.561 p <0.001*** **

*** Significant**
*****Highly Significant**

Table 6 shows that in pretest there was no significant difference between the experimental group and control group in the knowledge on various sub areas except for meaning and risk factors, investigations for identifying Rheumatoid Arthritis and treatment,but in Posttests I,II,and III there was significant difference between both groups in terms of knowledge on various sub areas ($p<0.001$).Hence, it is inferred that the Nurse Led Intervention were effective in enhancing the knowledge on various subareas.

Table - 7
Mean Difference of Knowledge among the Subjects in the Experimental Group and Control Group

(N = 106)

Groups	Assessment	Mean score	% of Mean score	Mean Difference of knowledge score with 95% Confidence interval	Percentage of knowledge score with 95% Confidence interval
Experimental Group (n = 54)	Pretest	9.22	18.44	19.81 18.24- 21.39	↑39.64 36.48-42.78
	Posttest-I	28.81	57.62		
	Posttest-II	26.52	53.04		
	Posttest-III	29.04	58.08		
Control Group (n = 52)	Pretest	7.88	15.76	1.46 1.95- 0.98	2.92 1.96-3.9
	Posttest-I	7.88	15.76		
	Posttest-II	8.51	17.02		
	Posttest-III	9.35	18.7		

Table 7 shows that the percentage increase in knowledge in the experimental group, after the Nurse Led Interventions was 39.64, whereas for the control group it was 2.92. The difference reveals that the Nurse Led Interventions were more effective than routine care in improving the knowledge of patients with Rheumatoid Arthritis.

Table - 8
Multiple Comparison of Knowledge Score among Subjects in the Experimental Group and Control Group

(N = 106)

Group	Assessments	Mean	Standard Deviation	ANOVA repeated measures		Comparison	Bonferroni 't' test	
				F value	p value		MD	P value
Experimental Group (n = 54)	Pretest	9.22	5.90	499.79	**<0.001*** **			
	Posttest 1	28.81	8.11			Pretest vs Posttest 1	19.59	**<0.001*** **
	Posttest 2	26.52	7.46			Pretest vs Posttest 2	17.30	**<0.001*** **
	Posttest 3	29.04	7.41			Pretest vs Posttest 3	19.82	**<0.001*** **
Control Group (n = 52)	Pretest	7.88	4.31	26.93	**<0.001*** **			
	Posttest 1	7.88	4.33			Pretest vs Posttest 1	0	1.000
	Posttest 2	8.52	4.22			Pretest vs Posttest 2	0.64	1.000
	Posttest 3	9.35	4.01			Pretest vs Posttest 3	1.47	0.473

***Very Highly Significant

Table 8 shows that the ANOVA F-values and Bonferroni 't' values obtained for experimental group were highly significant when compared to that of control group($p<0.001$). Therefore, it can be concluded that the Nurse Led Interventions along with routine care were more effective than routine care alone in enhancing the knowledge of the patients with Rheumatoid Arthritis.

Hence, the hypothesis **H_1** stating that *"there is a significant difference in the mean level of knowledge among patients with* Rheumatoid Arthritis *in the experimental and the control group after the nurse led interventions"* **was accepted.**

Discussion

The findings revealed that the patients with Rheumatoid Arthritis who received the Nurse Led Interventions and routine care had improvement in the knowledge when compared to those who received the routine care alone.Majority of the subjects in the experimental group (85.2%) and (94.2%) control group (94.2%) were in poor knowledge category during pretest. These results are correlating with the findings of Khalil, et al.[11] in the study to determine the level of disease awareness among patients of Rheumatoid Arthritis, only 3(1.5%) patients were considered aware; 48(25%) were considered partially aware; and 149(74.5%) were considered unaware. Studies conducted by Gulnur, et al. (2018) [13] and Pytel, Wrzosek (2012) [14] also revealed the same. Hence it is concluded that insufficient information about the disease is a general problem in Rheumatoid Arthritis patients necessitating development of educational programmes

Area wise analysis of knowledge scores revealed that, subjects of both experimental group and control group had maximum knowledge in the area 'arthritis an overview' during pretest followed by 'investigation' in the experimental group and 'Anatomy and Physiology' in the control group.Both the groups had least knowledge in the area 'Treatment' during pretest.The findings of the study are in par with that of Yarwood, et al.,[15], and Makelainen, et al.,[16]. Former reported that 80% of the patients had knowledge about at least one indication for lab investigation, 49% of the patients correctly identify one or more side effects of medication while 51% did not identify any side effect of the medications they were regularly taking. Interestingly, 54% of the patients couldn't identify even one type of drugs that they were regularly taking. They also found that the patients had best information on Rheumatoid Arthritis in general-etiology, symptoms, blood tests and exercise.The 'F' value obtained (499.785, $p<0.05$) proved that there was a significant difference in knowledge after the Nurse Led Interventions among patients with Rheumatoid Arthritis in the experimental group. The percentage increase in knowledge in the experimental group, after the Nurse Led Interventions was 39.64, whereas for the control group it was 2.92 at 95% CI. The 't' values obtained for knowledge on various sub areas of Rheumatoid Arthritis were significant at $p<0.001$, during posttests, revealing that there was a significant difference between the experimental group and control group. The post hoc multiple comparison of Bonferroni 't' test showed that the enhancement of knowledge was highly statistically significant ($p<0.001$) in the experimental group, but not significant in the control group ($p>0.05$).The study findings are supported by Soheir, et al.,[17] who concluded in their study that there were highly significant differences between both groups in all items of knowledge (at $P<0.01$) before and after the intervention. Manning, et al.,[18] also reported that knowledge scores were significantly higher among study group ($p<0.001$) after a rehabilitation programme on Rheumatoid Arthritis. So, they suggested that patient education can be recommended as an integral part of management in Rheumatoid Arthritis as this prepares the patient to undertake self-management activities and adhere to the treatment regimen. Gurjar, et al.,[19]also stated the significance of supportive educational intervention on knowledge ($p \leq 0.001$).

IV Conclusion.

Rheumatoid Arthritis usually affect people in the middle age with a mean age of onset between 40 and 50 years and majority patients were females..Lack of knowledge about the disease and its management is a significant problem among these patients.The Nurse Led Interventions including planned teaching programme, demonstration of exercises and small group counselling was found to be very effective in improving the knowledge of patients with Rheumatoid Arthritis.

V Ethical Considerations

This study received approval from Scientific Review Committee (SRC No:163/19 Dated 05/03/2019),Government College of Nursing, Kozhikode and Ethical Clearance from Institutional Ethical Committee (IEC number: CNC/105/2019-PhD Dated 15/03/2019), Government College of Nursing, Kozhikode. Informed consent obtained from study participants and confidentiality was assured.

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