



Effect of Nurse Led Interventions on Disease Activity of Patients with Rheumatoid Arthritis

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ABSTRACT

Background: Arthritis is an umbrella term for over 100 different types of disease. Arthritis is categorized as either inflammatory or non-inflammatory. Most common inflammatory arthritis is Rheumatoid Arthritis (RA) and non-inflammatory arthritis is Osteoarthritis¹. Objective of the study was to assess effect of nurse led interventions on disease activity 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 recruited by purposive sampling technique.

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

Conclusions: Study concludes that the nurse led interventions were effective in reducing the disease activity of patients with Rheumatoid arthritis.

KEYWORDS: Disease activity and Rheumatoid arthritis, Effect, Nurse led interventions.

I. INTRODUCTION

Arthritis is the group of conditions affecting the joints and typically causes swelling, pain and stiffness. Osteoarthritis & rheumatoid arthritis are the most common type of arthritis. Rheumatoid Arthritis is an autoimmune disease that mainly attacks the synovial tissues within the joints. Autoimmune diseases occur when the body's immune system mistakes its own tissues for foreign invaders, such as Bacteria or Viruses. The confused immune system develops antibodies to seek out and destroy the "invaders" in the synovium²

Rheumatoid Arthritis has a negative impact on individual's physical, social and psychological functioning, and the resulting disability contributes significantly to the burden of disease in Rheumatoid Arthritis³. Rheumatoid Arthritis causes impairment of all aspects of quality of life (limitation of physical function, physical disability, and pain), mental health disorders (anxiety and depression), and social, environmental, and also sexual dysfunction⁴. The disease activity is the most predictive factor of these dysfunctions⁵. The Conceptual frame work of this study is based on the concepts of revised Health Promotion Model by Nola J Pender (2002)⁶.

Nurse led care has the potential to provide more efficient and effective patient care. This includes a more stringent implementation of the treat-to-target concept, which may lead to a higher percentage of patients reaching their treatment targets, thereby improving patient-related outcomes, such as quality of life, functional capacity, and participation. Additionally, nurse led care may be highly cost-effective⁷. To address the many problems with rheumatology care in India, curricular reforms, capacity building, patient education and political support are surely needed.⁸

II. METHODS

A. Study design population, sampling technique and sample size

Quasi-experimental non-equivalent time series design was adopted for the study. The study was carried out among patients who are diagnosed as Rheumatoid Arthritis, and attending the Rheumatology clinic of new Medical College Hospital, Kozhikode from 5th July, 2019 to 28th February, 2020. Total 106 patients with rheumatoid arthritis were selected for the study by purposive sampling technique.



B. Criteria of sample selection

1. 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.

2. 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.

C. Data Collection procedure

The study was conducted from 5th July, 2019 to 28th February, 2020. A purposive sampling technique was used to recruit samples in the present study. Administrative permission was obtained from the Medical Superintendent, Principal and Head of Department of Medicine, New Medical College Hospital, Government Medical College, Kozhikode as per order number E2/3761/2019 Dated 28/02/2019. Disease activity was assessed using DAS 28 scale. DAS stands for Disease Activity Score. Developed by Van Riel et al., (2001).⁹ Department of Rheumatology, University Medical Center Nijmegen, The Netherlands. It has 4 items namely Swollen Joint Count (0-28), Tender Joint Count (0-28), ESR, pain and general health assessment on a visual analogue scale (0-100 mm). The DAS28 includes counting of tender and swollen joints on either side of the body, and erythrocyte sedimentation rate, and a general health assessment (on a visual analog scale). The joints assessed are shoulder, elbow, wrist, knee, metacarpophalangeal joints and proximal interphalangeal joints. The researcher assessed the disease activity by using the observation checklist. It took nearly 10 minutes per patient. The staging of disease based on DAS 28 scale according to the American Rheumatologic Association criteria. Remission-<2.6, Low disease activity → 2.6 to ≤ 3.2, Moderate disease activity-> 3.2 to ≤ 5.1, High disease activity-> 5.1. Reliability was done among 10 Rheumatoid Arthritis patients by using Inter-rater reliability. Karl Pearson's coefficient of correlation was used and the Cronbach's Alpha value obtained was 0.943. Subjects who were attending the Rheumatology clinic of NMCH, Kozhikode were scrutinized for eligibility criteria. Those fulfilling inclusion criteria were approached for obtaining a written consent after giving an adequate explanation about the study. Subjects consented to participate in the study were recruited. 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. Disease activity was measured using DAS 28 scale. It was marked by the researcher using the observation checklist in the scale, VAS for health status and ESR value obtained from the patient record.

1. Hypotheses:

H₁: There is a significant difference in the disease activity among the patients with Rheumatoid Arthritis in the intervention and the control group after the nurse led interventions.

H₂: There is a significant association between the pretest level of disease activity of patients with Rheumatoid Arthritis and selected socio-demographic and clinical variables.

2. 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 also used for data analysis

D. Ethical Considerations

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



III. RESULTS

Data was analysed using descriptive and inferential statistics.

Table I shows distribution of selected socio demographic variables of subjects with Rheumatoid Arthritis. The data presented in the table I revealed that 20 (37.0%) subjects in the intervention group belonged to the age group 41-50 years and 20 (38.5%) subjects in the control group belonged to the age group 51-60 years. Most of the subjects 46 (85.2%) in the intervention group and 49(94.2%) control group were females. Half of the subjects 27(50.0%) were Islam, 23(42.6%) were Hindus in the intervention group, similarly in the control group 27(51.9%) were Islam and 24(46.2%) were Hindus. Regarding educational status, 25(46.3%) subjects had only primary education in the intervention group, like wise in the control group 24(46.2%) had primary education. Most of the subjects 45(83.3%) in the intervention and 40(76.9%) in the control group were married. Distribution of subjects according to number of family members revealed that 34(63%) subjects in the intervention group and 36(69.2%) subjects in the control group were having four to six members in the family. In relation to occupation, 43(79.6%) in the intervention and 47(90.4%) in the control group were house wives. Regarding the family income, 38(70.4%) subjects in the intervention group and 33(63.5%) in the control group were having an annual income of more than Rs. 27000/-. 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 these socio-demographic variables.

Table II presents the distribution of selected clinical variables of subjects with Rheumatoid Arthritis. Regarding the age of onset 24(44.4%) subjects in the intervention group and 24(46.2%) subjects in the control group have the age of onset of illness at 41-50 years. The family history of Rheumatoid Arthritis revealed that, 47(87%) subjects in the intervention group and 45(86.5%) subjects in the control group did not have family history of Rheumatoid Arthritis. The table depicts that, 51(94.4%) subjects in the intervention group and 50(96.2%) subjects in the control group were nonsmokers. The exercise habits revealed that 42(77.8%) subjects in the intervention group and 38(73.1%) subjects in the control group were not doing exercise. Sleep habits revealed that, 36(66.7%) subjects in the intervention group and 29(55.8%) subjects in the control group slept for 5-7 hours per day. The chi-square values obtained were not significant ($P>0.05$) indicated that, both the groups were similar and comparable with regard to these clinical variables.

Table III shows the comparison of level of disease activity of subjects in the intervention group and control group during pretest, posttest - I, posttest - II and posttest - III. In pretest, in the group, 36 intervention (66.7%) of the subjects had high disease activity, 17(31.5%) had moderate, 1(1.9%) had low disease activity and none in remission category. In the control group, 45(86.5%) of the subjects had high disease activity, 6(11.5%) had moderate, 1(1.9%) had low disease activity and none in remission category. In posttest I, in the intervention group, 36(66.7%) of the subjects had high disease activity, 17(31.5%) had moderate, 1(1.9%) had low disease activity and none in remission category. In the control group, 43(82.7%) of the subjects had high disease activity, 8(15.4%) had moderate, 1(1.9%) had low disease activity and none in remission category. It is revealed that there is no change in disease activity from pretest to posttest I. In posttest II, in the intervention group, 14(25.9%) of the subjects had high disease activity, 33(61.1%) had moderate, 5(9.3%) had low disease activity and none 2 (3.7%) remission category. In the control group, 22(42.3%) of the subjects had high disease activity, 27(51.9%) had moderate, 3(5.8%) had low disease activity and none in remission category. In posttest II the percentage of subjects with high disease activity reduced considerably in the intervention group. In posttest III, in the intervention group, 5(9.3%) of the subjects had high disease activity, 33(61.1%) had moderate, 5(9.3%) had low disease activity and none 11 (20.4%) remission category. In the control group, 19(36.5%) of the subjects had high disease activity, 25(48.1%) had moderate, 8(15.4%) had low disease activity and none in remission category. The percentage of subjects in the high disease activity category was less and percentage of subjects in the remission category also increased. The Chi-square value obtained was significant at $p<0.001$ indicating that Nurse Led Interventions were more effective compared to routine care.



Table – I. Distribution of Selected Socio Demographic Variables of Subjects with Rheumatoid Arthritis

(N = 106)

Demographic Variables	Sub-Variables	Intervention 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 (NS)
	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 (NS)
	Female	46	85.2	49	94.2			
Religion	Hindu	23	42.6	24	46.2	1.784	2	0.410 (NS)
	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 (NS)
	High School	22	40.7	20	38.5			
	College	3	5.6	-	-			
	Technical / Professional	-	-	1	1.9			
	No Formal Education	4	7.4	7	13.5			
Marital Status	Married	45	83.3	40	76.9	3.617	3	0.306 (NS)
	Unmarried	4	7.4	2	3.8			
	Widow/Widower	5	9.3	8	15.4			
	Divorced	-	-	2	3.8			
Number of Family Members	1 – 3	11	20.4	11	21.2	4.113	2	0.942 (NS)
	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 (NS)
	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 (NS)
	Rs. <27,000	38	70.4	33	63.5			
Predominant Support System	Family	49	90.7	43	82.7	9.023	5	0.108 (NS)
	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 II. 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 (NS)
	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 (NS)
	No	47	87.0	45	86.5			
Habit of Smoking	Yes	3	5.6	2	3.8	0.172	1	0.678 (NS)
	No	51	94.4	50	96.2			
Habit of Exercise Regularly	Yes	12	22.2	14	26.9	0.316	1	0.574 (NS)
	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 (NS)
	5 – 7	36	66.7	29	55.8			
	> 7	11	20.4	13	25.0			

Table IV shows the mean and standard deviation of disease activity of subjects in the intervention group at pretest, posttest -I, posttest- II and posttest- III. The mean disease activity score was 5.75 with a standard deviation of 1.18 in the pretest. It remained same in posttest I the mean difference was 0. During posttest II the mean disease activity score obtained was 4.35 with a standard deviation of 0.99. The mean difference was 1.40. The ‘t’ value obtained revealed that the difference is statistically significant ($p < 0.001$). During posttest III, the mean disease activity score obtained was 3.81 with a standard deviation of 1.09. The mean difference was 1.95. The ‘t’ value obtained revealed that the difference is statistically significant ($p < 0.001$). The above findings show that there is a change in disease activity from high to moderate among the subjects in the intervention group after the Nurse Led Intervention. Hence it was concluded that there is a significant difference in the disease activity of patients with Rheumatoid Arthritis in the intervention group after the Nurse Led Interventions.

Table V shows the mean and standard deviation of disease activity of subjects in the control group at pretest, posttest I, posttest – II and posttest III. The mean disease activity score was 6.13 with a standard deviation of 1.14 in the pretest. It was reduced to 6.09 in posttest I with a standard deviation of 1.19. The mean difference was 0.40. During posttest II the mean disease activity score obtained was 5.04 with a standard deviation of 1.01. The mean difference was 1.09. The ‘t’ value obtained revealed that the difference was statistically significant at $p < 0.001$. During posttest III, the mean disease activity score obtained was 4.59 with a standard deviation of 1.23. The mean difference was 1.54. The ‘t’ value obtained revealed that the difference is statistically significant $p < 0.001$. The above findings show that there was a change in disease activity from high to moderate among the subjects in the control group after the routine care too. But the mean difference was not as significant as that for the intervention group.

Table VI shows the multiple comparison of disease activity among the subjects in the intervention group and control group at pretest, posttest -I, posttest - II and posttest - III. Statistical significance was calculated using repeated measures analysis of variance F-test. Multiple comparison of pretest and posttest-I differences, pretest and posttest-II differences and pretest and posttest-III differences are calculated using Bonferroni ‘t’ test. In intervention group, repeated measures ANOVA F- test showed that the mean disease activity score had statistically significant reduction between pretest and posttest-III ($F = 145.429, p < 0.001$). Post hoc multiple comparison of Bonferroni ‘t’ test shows that the disease activity remained same in pretest and posttest-I (5.75 ± 1.18 and the mean difference is 0), which was not statistically significant ($p = 1$). In posttest-II, there was reduction in disease activity (5.75 ± 1.18 vs 4.35 ± 0.99 , respectively and the mean difference is 1.40), which was highly statistically significant ($p < .001$). In posttest-III, the disease activity further reduced (5.75 ± 1.18 vs 3.81 ± 1.09 respectively, and the mean difference is 1.94), which was also a highly statistically significant reduction from pretest to posttest-III ($p < .001$). Therefore, it can be concluded that the Nurse Led Interventions were very effective in reducing the disease activity score significantly in the intervention group.



Table III. Comparison of Level of Disease Activity of Subjects in the Intervention Group and Control Group during Pretest, Posttest - I, Posttest - II and Posttest – III (N = 106)

Assessment	Disease activity	Grading of scores	Groups				Chi-square value	P value
			Intervention Group (n=54)		Control Group (n=52)			
			No.	%	No.	%		
Pretest	Remission	<2.6	-	-	-	-	6.225	p=0.044 df=2 (NS)
	Low disease activity	≥2.6 to ≤3.2	1	1.9	1	1.9		
	Moderate disease activity	>3.2 to ≤5.1	17	31.5	6	11.5		
	High disease activity	>5.1	36	66.7	45	86.5		
Posttest – I (4 weeks)	Remission	<2.6	-	-	-	-	3.824	p=0.147 df=3 (NS)
	Low disease activity	≥2.6 to ≤3.2	1	1.9	1	1.9		
	Moderate disease activity	>3.2 to ≤5.1	17	31.5	8	15.4		
	High disease activity	>5.1	36	66.7	43	82.7		
Posttest – II (8 weeks)	Remission	<2.6	2	3.7			4.842	p=0.362 df=3 (NS)
	Low disease activity	≥2.6 to ≤3.2	5	9.3	3	5.8		
	Moderate disease activity	>3.2 to ≤5.1	33	61.1	27	51.9		
	High disease activity	>5.1	14	25.9	22	42.3		
Posttest – III (12 weeks)	Remission	<2.6	11	20.4			20.932	p<0.001*** df=3 (S)
	Low disease activity	≥2.6 to ≤3.2	5	9.3	8	15.4		
	Moderate disease activity	>3.2 to ≤5.1	33	61.1	25	48.1		
	High disease activity	>5.1	5	9.3	19	36.5		

Table IV. Mean and Standard Deviation of Disease Activity of Subjects in the Intervention Group at Pretest, Posttest - I, Posttest-II and Posttest – III

Assessment	Mean	SD	Mean Difference	t' value	P value
Pretest	5.75	1.18	0	-	-
Posttest I	5.75	1.18			
Pretest	5.75	1.18	1.40	12.052	<0.001*** (S)
Posttest II	4.35	0.99			
Pretest	5.75	1.18	1.95	13.470	<0.001*** (S)
Posttest III	3.81	1.09			



Table V. Mean and Standard Deviation of Disease Activity of Subjects in the Control Group at Pretest, Posttest - I, Posttest-II and Posttest – III

Assessment	Mean	SD	Mean Difference	't' value	P value
Pretest	6.13	1.14	0.40	1.121	0.268 (NS)
Posttest I	6.09	1.19			
Pretest	6.13	1.14	1.09	11.733	<0.001*** (S)
Posttest II	5.04	1.01			
Pretest	6.13	1.14	1.54	11.295	<0.001*** (S)
Posttest III	4.59	1.23			

(n = 52)

Table VI. Multiple Comparison of Disease Activity Score among Subjects in the Intervention Group and Control Group

(N = 106)

Groups	Assessments	Mean	SD	ANOVA Repeated Measures		Comparison	Bonferroni 't' test	
				F value	P value		MD	P value
Intervention Group (n =54)	Pretest	5.75	1.18	145.429	<0.001*** (S)			
	Posttest - I	5.75	1.18			Pretest vs Posttest - I	0	1.000 (NS)
	Posttest - II	4.35	0.99			Pretest vs Posttest – II	1.40	<0.001*** (S)
	Posttest - III	3.81	1.09			Pretest vs Posttest - III	1.94	<0.001*** (S)
Control Group (n = 52)	Pretest	6.13	1.14	93.651	<0.001*** (S)			
	Posttest - I	6.09	1.19			Pretest vs Posttest - I	0.40	1.000 (NS)
	Posttest - II	5.04	1.01			Pretest vs Posttest – II	1.09	<0.001*** (S)
	Posttest - III	4.59	1.23			Pretest vs Posttest - III	1.54	<0.001*** (S)

In control group, Repeated measures ANOVA F- test showed that the mean disease activity score did not reduce significantly between pretest and posttest-III (F = 93.651, p =0.001). Post hoc multiple comparison of Bonferroni 't' test shows the reduction of level of disease activity from pretest to posttest - I (6.13 ± 1.14 vs 6.09 ± 1.19, respectively, and the mean difference is 0.40), which was not statistically significant (p=1). In posttest - II, the level of disease activity slightly reduced (6.13 ± 1.14 vs 5.04 ± 1.01, respectively mean difference is 1.09), but not statistically significant (p> .05). In posttest-III, (6.13 ± 1.14 vs 4.59 ± 1.23, respectively mean difference is 1.54), which was significant. The p value obtained p < 0.001 indicated that the disease activity of the subjects in the control group reduced significantly. Therefore, it can be concluded that the routine care could also significantly reduce the disease activity of the subjects in the control group but the mean difference revealed that it was more significant in the intervention group who received the Nurse Led Interventions.

Table VII shows the association between pretest level of disease activity and selected demographic variables of patients with Rheumatoid Arthritis. The chi-square test value obtained revealed that there was no significant association between pretest level of disease activity and selected demographic variables (p>0.05).



Table VII. Association between Pretest Level of Disease activity and Selected Socio-Demographic Variables of Patients with Rheumatoid Arthritis in the Intervention Group and Control Group

(N = 106)

<i>Socio- Demographic Variables</i>	χ^2 value	df	<i>P</i> value
Age	3.800	3	0.284 (NS)
Gender	2.536	1	0.111 (NS)
Religion	1.895	2	0.388 (NS)
Educational status	4.934	4	0.294 (NS)
Economic status	1.066	1	0.302 (NS)
Support system	8.841	5	0.116 (NS)
Occupation	5.954	3	0.114 (NS)
Marital status	3.465	3	0.325 (NS)
Number of family members	5.095	10	0.885 (NS)
Predominant support system	8.841	5	0.116 (NS)

Table VIII. Association Between Pretest Level of Disease Activity and Selected Clinical Variables of Patients with Rheumatoid Arthritis in the Intervention Group and Control Group

(N = 106)

<i>Clinical Variables</i>	χ^2 value	df	<i>P</i> value
Age of onset	0.158	2	0.924
Family history	0	1	1.000
Exercise habits	0.986	1	0.321
Habit of smoking	0.210	1	0.657
Daily hours of sleep	7.567	9	0.578

Table VIII shows the association between pretest level of disease activity and selected clinical variables of patients with Rheumatoid Arthritis. The chi-square test value obtained revealed that there was no significant association between pretest level of disease activity and selected clinical Variables such as age of onset, family history of Rheumatoid Arthritis exercise habits, habit of smoking and daily hours of sleep ($p > 0.05$).

IV. DISCUSSION

Disease activity is the best predictor of joint damage and physical disability, both of which can lead to reduction in quality of life and premature mortality¹⁰Measures such as educational, behavioral and cognitive strategies are utilized to enhance patient participation in treatment. Nurse led care is gaining momentum in terms of its efficiency and cost effectiveness in many developed



countries. But there is lack of published literature or studies from developing countries. The results are supported by several studies done in different countries. Williams, et al.,¹¹ did a randomized controlled trial to assess the effectiveness of exercise programme, on physical functioning proved significant effects. Thomsen, et al.,¹² also reported similar findings at significance level of $p < 0.0001$ for the intervention group. The findings correlate with that of Ndosi, et al., in a systematic analysis to assess the effect of NLC for patients with Rheumatoid Arthritis, significant improvements ($P < 0.001$) in clinical outcomes (disease activity, pain, fatigue, and morning stiffness) of nurse led care group. Likewise, a significant between-group difference in disability ($P = 0.022$), function ($P = 0.011$), non-dominant handgrip strength ($P = 0.009$), self-efficacy ($P = 0.021$) for pain and ($P = 0.039$ for symptoms), and disease activity ($P = 0.047$) were noted in a systematic review by Manning, et al.¹³ in an investigation to evaluate the effect of an exercise programme.

Likewise, a significant between-group difference in disability ($P = 0.022$), function ($P = 0.011$), non-dominant handgrip strength ($P = 0.009$), self-efficacy ($P = 0.021$) for pain and ($P = 0.039$ for symptoms), and disease activity ($P = 0.047$) were noted in a systematic review by Manning, et al.¹³ in an investigation to evaluate the effect of an exercise programme. Improvement of pain intensity ($P = 0.006$.) and DAS 28 score ($P < 0.00001$) were reported following a mindfulness group intervention by Zhou, et al.¹⁴.

The major strengths of the study were:

1. Repeated follow up and reinforcement which ensured adherence of the patients with Rheumatoid Arthritis to the Nurse Led Interventions.
2. The instruments used in the study were standardized with established validity and reliability. Subjective and objective measures were used for data collection.

The limitations of the study were:

1. The study was conducted on an outpatient basis, so close monitoring of the subjects was not possible.
2. The patients were asked to maintain a diary to record the exercise details, and the investigator has to assume that they were truthful.

V. CONCLUSION

The present study was conducted to evaluate the effect of Nurse Led Interventions on disease activity of patients with Rheumatoid Arthritis. The findings revealed that the patients with Rheumatoid Arthritis who received the Nurse Led Interventions and routine care had improvement in the disease activity when compared to those who received the routine care alone. Study also found that there is no association between the disease activity of patients with Rheumatoid Arthritis and selected socio-demographic and clinical variables before the nurse led intervention.

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