The Relationship between Self-reported Chronic Pain and Pain related Functional Limitations among Patients with Rheumatoid Arthritis

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Abstract:

Chronic pain of patients with rheumatoid arthritis is a very exhausting complaintfor them either physically, socially, emotionally, or economically. Chronic pain has a vital role in determining the functional abilities of patients with rheumatoid arthritis. **Aim:** Determine the relationship between self-reported chronic pain and pain related functional limitations among patientswith rheumatoid arthritis. **Subjects and method:Setting:** Rheumatoid outpatient clinics of Mansoura UniversityHospital.**Subjects:** 178 patientswere recruited. **Tools**: Three tools were used for datacollection: 1) Socio-demographic and Clinical Data of Patients with Rheumatoid Arthritis Structured Interview Schedule, 2) Self-Reported Chronic Pain Assessment of Patients with Rheumatoid Arthritis Structured Interview Schedule, 3) Pain Related Functional Limitations Assessment of Patients with Rheumatoid Arthritis Structured Interview Schedule. **Results:** More than one half of the study subjects reported greater suffering from chronic pain such as longer duration of chronic pain history, frequent daily pain which persist for longer duration oftime and characterized by greater level of severity. Also, the similar percentage of them reported severe level of pain related functional limitations. **Conclusion:** Suffering from chronic pain is significantly associated with greater level of pain related functional limitations among the study subjects. **Recommendations:** nurses should assesspatientsfor their pain history, and their perceived pain related functional limitations. The nurse should act collaboratively with the patients and health team members to alleviate the patients' suffering and pains to enhance their functional abilities and to decrease their functionallimitations.

***Keywords*:** Rheumatoid arthritis; Patients; Functional limitations; Chronic pain.

Introduction

Rheumatoid Arthritis (RA) is an autoimmune disease characterized by a chronic symmetrical polyarthritis of large and small joints, and morning stiffness, which can lead to musculoskeletal impairment, and functional disabilities[1, 2].The burden of disease course varies and the prediction of the prognosis is difficult to estimate. In the long term, RA reduces function which leads to difficulties of doing daily living activities, and subsequently impact negatively onpsychosocial aspect [3].

Rheumatoid Arthritis affecting 0.5 to 1% of the adult population of developed regions with predominance of 2 to 3 times more in females. It affects all age groups but is more prevalent among 40 to 60 years people [4]. In rural Egypt, prevalence of up to 0.3% was found in the adult population.

Pain is defined as chronic if persists for more than three months and usually lasts for several months or years [5]. Chronic pain involves more thanonesite and usually leads to the utilization of greater number of pain relieving drugs, poor outcomes of interventions, low quality of sleep, and greater emotional problems. It influences daily functional abilities and becomes chiefcomplain formany patients[5, 6].

Most patientswith rheumatoid arthritis experience limitations in performing daily basic activities and one quarter of them are found to have poor general physical performance. These limitations may be related to the pathological changes associated with the disease, such as morning stiffness, decreased joint movement, crepitation, and muscle weakness, or due to the effect of chronicpain [12, 13].

Chronic pain can restrain abilities to do daily activities, like housekeeping, dressing or food preparation. The outcomes of chronic pain on the functional status can be wide reaching and overwhelming of patients diagnosed with rheumatoid arthritis.While, the pain-related functional limitations are characterized by loss of the capability to perform necessary tasks in any important life domain such as physical, social, emotional, and cognitive function. It supposed to be the chief reasons to look for medical attention [14, 15].

Managing chronic pain differ from the acute pain management where its treatment emphasizes on lowering of pain related functional limitations, reduction ofemotional distress and decrease of pain. Managing chronic pain involves a

comprehensive approach which is basedon detailed assessment of pain and assessing its effects on functional ability [16].

The association between chronic pain and perceived pain related complaints received little attention from the scientific researches. So, this research aimed to determine this relation.

Aim of the Study

Determine the relationship between self-reported chronic pain and pain related functional limitations among patients with rheumatoid arthritis.

Research Question

What is the relationship between self-reported chronic pain and pain related functional limitations among patients with rheumatoid arthritis?

Subjects and Method

Design: The study followed a descriptive correlational research design.

Setting: The study was carried out at the outpatient clinic for rheumatologyof Mansoura UniversityHospital. These clinics are specialized in diagnosis and treatment of rheumatoid. They are 2 clinics that work five days per week from Saturday to Wednesday from 9 am to 2 pm. The monthly patients' attendance rate is about 280 to 300 females and males patients with rheumatoid conditions. Among those patients about 140 to 150 patients are diagnosed with rheumatoid arthritis.

Subjects: The study involved 178 patients diagnosed with rheumatoid arthritis and fulfilling the following criteria:

- Age 21-60 years old
- Suffer from chronic arthritic pain for more than three months.
- Did not have any auditory, visual or psychological problems.
- Free from cancer related pain or diabetesmellitus.
- Free from any acute pain conditions such as, surgery, fracture, burn, injury, or dental problems that may alter the study subjects' perception of chronic pain related functionallimitations.

The number of the study subjects was estimated using the EPI info 7.0 program according to the following parameters; population size: 300, 5 % possible error and confidence coefficient 95%, and minimal sample size equal 168.

Tools

Three tools were used in this study to collect the necessary data as follows:

Tool I: Socio-demographic and Clinical Data of Patients with Rheumatoid arthritis Structured Interview Schedule Researchers developed this toolbased on review of relevant literature to assess the socio-demographic and clinic data of the study subjects asfollows;

- Socio-demographic data such as sex, age, marital status and level of

education, and place of residence.

- Clinical data such as the current medical history of other health problems rather than rheumatoid arthritis.

Tool II: Self-Reported Chronic Pain Assessment of Patients with Rheumatoid arthritis Structured Interview Schedule

This tool was developed bythe researchers based on review of relevant literature [17,18] to assess the history ofchronic pain as perceived by the studysubjectswithin the last week. Itincluded questions related to:

- The duration of chronic arthritic pain in years.
- Sites of pain.
- Type, frequency, duration (per day), and severity ofpain.
- Presence of associated symptoms with pain.
- Factors increasing pain intensity.
- Pain management among the study subjects such as consumption of medications and its perceivedeffectiveness (percentages of its effectiveness to relieve pain ranges from 0% to 100%) and the use of non-pharmacological pain management interventions.

Tool III: Pain Related Functional Limitations Assessment of Patients with Rheumatoid arthritis Structured Interview Schedule

This tool was developed by the researchers to assess the degreeoffunctional limitations due to chronic pain as reported by the patients with rheumatoid arthritis within the last week. This tool covered 8 domains as follows; 1) Basic self- careactivitiessuch asfeeding anddressing,mobility such as walking and transfer,Sleeping quality, 4) Social relations such as family visits, 5) Memorization and mental concentration, 6) Instrumental activities either indoor or outdoor activities such as housekeeping and shopping respectively, 7) Recreational activities such as practicing hobbies and watching TV, and 8) Emotional health and general feeling condition. Foreach domain, the respondent were asked to indicate to what extent theirchronic pain limits their functioning this domain using a three points Likert scale ranged from zero (no limitations), 1 (mild limitations), 2 (moderate limitations) and 3 (severe limitations). By calculating all 8 domains, a total pain related functionallimitations index wasderived. The higherthe score,thegreater the pain relatedfunctional limitations. The total score wasclassified into four levels asfollows;

- No pain related functionallimitations: take score ofzero.
- Mild pain related functional limitations: take score of1-8.
- Moderatepainrelatedfunctional limitations: take score of9-16.

- Severe pain related functional limitations: take score of 17-24.

Method

- Permission to carry out the study from the responsible authorities from the Faculty of Nursing, MansouraUniversity wasobtained.
- Permission to gather the required data from the head of the study setting was obtained, after being informed about the purpose of the study, the date and timeof datacollection.
- Tool I was developed by the researchers through reviewing of relevantliterature to assess the socio-demographic and clinical data of the studysubjects.
- Tool II, III were developed by the researchers based on reviewing the relevant literature[17,18] to assess the self-reported chronic pain and pain related functional limitations of the study subjectsrespectively.
- Tools II and III were tested for content validity by seven experts in the related field of the study and the required modifications were doneaccordingly.
- Tool II and IIIweretestedfor reliability. The Cronbach's Coefficient alpha was 0.80 for tool II, and 0.76 for toolIII
- A pilot study was conducted on 20patientswho were selected from the study setting and were not included in the study sample. The pilot study aimed to assess the tools fortheirclarity and applicability and essential modifications were done accordingly.
- The researchers were availableduring the time of physical examination of the patients to ensure the medical diagnosis by the attending physician.
- After ensuring the diagnosis of rheumatoid arthritisby theattending physicians, the researchers start to select their study subjects according tothe other inclusioncriteria
- Patients with rheumatoid arthritisand who fulfilled the study inclusion criteria were interviewed individually by the researchers in the waiting area of the outpatient clinics tocollectthe necessary data after explaining the study purpose.

Ethical considerations

Informed witness consent was obtained from each study subject included in this study after explaining the study purpose. Anonymity and privacy ofthestudy subjects, confidentiality ofthecollected data and the subjects' right to withdraw atany time wereassured.

Statistical Analysis

The collected data were analyzed by computer using the Statistical Package for Social Sciences (SPSS) software version 20. Reliability of the tools was determinedby Cronbach's Coefficient alpha. Data were presented by descriptive statistics inthe

form of frequencies and percentages for qualitative variables, and arithmetic mean and standard deviation for quantitative variables. Comparison of means wasdone by Student's t test and One Way Analysis of Variance (ANOVA).Significant difference was considered if p≤0.05.

Results

Table (1)shows that 80.9% of the study subjectsarefemales with their mean age was 39.50± 6.997years,59.0% married,more than half of the study sample was63.5% illiterate, and 68.5% are housewives. Only 6.2%of the study subjects are current workers. The monthly income as reported by82.6%of the study subjects is to be inadequate. As regards the place of residence, 60.1% of the study subjects live in urban areas and 88.2% of them are living with theirfamily.

Table (2) indicates that 32.0%, 12.4%, 11.2% of the study subjects suffer from either hypertension, heart diseases, or gastrointestinal disordersrespectively.

Table (3) shows that both knees joints, vertebrae, and both ankles jointsarethe most sites of pain as reported by the study subjects, 73.0%, 43.3%, and 32.6% respectively. Other sites ofpaininclude neck joint 24.7%, and bilateral shoulders joints14.0%.

The same table shows that 61.8% of the study subjects reported either 1 or 2 sites of pain, while, 30.9%, 7.3% of them reported suffering from pain in 3 to 6 sites or more than 6 sites respectively. Also, 51.1% of study subjects suffer from chronic arthritic pain for more than three years with a mean duration of4.74±3.55.

Table (4) indicates that dull aching pain and stabbing pain are the main two types of pain which reported bythe study subjects as follows, 39.9%, 16.9% respectively. In addition, the higher percentages of the study subjects experience severe pain intensity 59.0%, frequent pain more thanonceper day 55.1%, persistence of pain for long duration per day57.9%.

Regarding factors which increase pain intensity, 79.2%, 59.6%, and 50.6%of the study subjects reportedthatwalkingfor long distances, standing for long time, and sitting for long periods aggravatetheir pain respectively.

Furthermore, joints stiffness, headache, and sleep disturbance are themain symptoms associated with pain asreportedby the study subjects as follows, 70.2%, 25.8%, and 22.5% respectively.

Table (5) shows despitethatthe majority of the study subjects 83.1% consume pain relievingmedicationsand 50% of them reportedthatthese medications are prescribed, 35.4%, and 33.1% of the study subjects reported no or moderate satisfaction with their pain medications

respectively due to the occurrence of adverse side effects or their ineffectiveness. The mean score of pain medications' effectiveness asreportedby the study subjects is 50.98±31.35.

Concerning theusage of non-pharmacological pain management among the study subjects, 23.9% of them depend only on medications forrelievingtheir pains, while 28.7%, 21.3%, 20.0%,19.1%used to relieve their pain by depending on personal assistance of others in managing their dailyactivities,expressingtheir feeling about their pain with others, walking or physical exercises, andhavingaperiod of rest or sleeprespectively.

Table (6) illustrates that all domains of functional status are severely affected by pain as reported by thehigherpercentages of the study subjects except for basic self- care activities domain. For illustration, self- care activities show either no, simple, or moderate limitations due to pain among 27.0%, 39.9%, and 27.0% of the study subjectsrespectively.

Regarding the levels of total pain related functional limitations, this table indicates that only 2.2% of the study subjects do not suffer from any pain related functional limitations, while 52.8%, 32.6%, 12.4% of them reported severe, moderate or mild levels of pain related functional limitations respectively with a mean score of 15.63±6.10.

Table (7) indicates that females study subjects have greater overall pain related functional limitations 16.13±6.05,and higher levels ofemotional,sleep,and mental concentration disturbances related to their pains more than males.Thedifferences are statistically significant, p≤0.05.

Moreover, study subjects whoare widows show higher pain related concentrations problems more than theothers 1.94±0.94. The difference is statistically significant, F=5.59,p=0.004.

Table (8) shows that as the duration of suffering from pain increased for more than three years, the studysubjects'complaints of the following pain related limitations increased; emotional disturbance 2.30±0.89, mobility limitations 2.45±0.78, poor sleep quality 2.22±0.94, limited performance of instrumental activities 2.29±0.91, limited participation in recreational activities 2.31±1.04, and greater overall pain related functional limitations 16.75±5.55. The differences are statistically significant p≤0.05.

Furthermore, this table indicates that higher total pain relatedfunctional limitations 20.23±2.80 and higher levels of different domains of functional limitations are associated significantly with moresites of pain, 6 joints and more,p≤0.05.

Table (9) shows that, as the frequency,

severity and duration of pain per day increased among the study subjects, their perception of pain related functional limitations is increased and the differences are statistically significant p≤0.05.

Table (10) illustrates that greater mean scores of pain related functional limitations are significantly associated with greater dissatisfaction of the study subjects with their pain relieving medications. The differences are statistically significant p≤0.05.

Moreover, study subjects who do not use any non-pharmacological pain measures reported greater mean scores of overall and different domains of pain related functional limitations. The differences are statistically significant p≤0.05.

Table (1): Distribution of the study subjects according to their socio-demographic characteristics

Socio-demographic characteristics	No =178	%
Sex		
Male	34	19.1
Female	144	80.9
Age (Mean ± SD)	**39.50± 6.997**	
Marital status		
Married	105	59.0
Widow	67	37.6
Divorced	6	3.4
Level of education		
Illiterate	113	63.5
Read and write	30	16.9
Primary education	25	14.0
Secondary education	10	5.6
Occupation prior to retirement		
House wife	122	68.5
Skilled worker	22	12.4
Unskilled worker	22	12.4
Employee	12	6.7
Current work status		
Yes	11	6.2
No	167	93.8
Monthly income		
Enough	31	17.4
Not enough	147	82.6
Place of residence		
Urban	107	60.1
Rural	71	39.9
Living style		
With family	157	88.2
Alone	21	11.8

Table (2): Distribution of the study subjects according to their health history

Health history	No=178	%
Presence of other health problems rather than rheumatoid arthritiss		
Hypertension	57	32.0
Heart diseases	22	12.4
Gastrointestinal disorders	20	11.2
Respiratory disorders	11	6.2
Ophthalmological disorders	10	5.6
Hyperthyroidism	5	2.8

#

More than one answer was given

Table (3): Distribution of the study subjects according to their sites and duration of chronic pain

Sites of pain (n=178)	Unilateral pain		Bilateral pain	
	No.	%	No.	%
Site of pain #				
Neck joint	44	24.7	- 25	-14.0
Shoulder joint	20	11.3	9	5.1
Elbow joint	2	1.2	19	10.7
Wrist joint	3	1.7	14	7.9
Fingers joints	0	0.0	0	0.0
Hip joint	1	0.6	130	73.0
Knee joint	26	14.6	58	32.6
Ankle joints	10	5.6	0	0.0
Toesjoints	9	5.1	0	0
Vertebrae	77	43.3	0	0
Number of affected sites	**No =178**		**%**	
1-2 sites	110		61.8	
3 – 6 sites	55		30.9	
More than 6 sites	13		7.3	
Duration of suffering from chronic pain in years	**No =178**		**%**	
1-3 year	87		48.9	
>3 year	91		51.1	
Mean ± SD.	4.74 ± 3.55			

More than one answer was given

Table (4): Distribution of the study subjects according to their pain characteristics

Characteristics of pain	No=178	%
Type of pain		
Dull aching	71	39.9
Stabbing	30	16.9
Throbbing	23	12.9
Tingling	21	11.8
Heaviness	19	10.7
Burning	14	7.9
Severity of pain		
Mild	4	2.2
Moderate	69	38.8
Severe	105	59.0
Frequency of pain		
More than one time per day	98	55.1
Once per day	35	19.7
Some days per week	45	25.3
Duration of pain per day		
Short duration	8	4.5
Moderate duration	67	37.6
Long duration	103	57.9
Factors which increase pain intensity#		
Walking for long distance	141	79.2
Standing for long period	106	59.6
Sitting for long period	90	50.6
Climbing stairs	47	26.4
Carry heavy objects	31	17.4
Cold weather	18	10.1
Symptoms associated with pain#		
Joints stiffness	125	70.2
Headache	46	25.8
Sleep disturbance	40	22.5
Inflammatory signs (hotness, swelling)	31	17.4
Tiredness	19	10.7
Crepitation	19	10.7
Muscles spasm	11	6.2
Numbness	9	5.1
Shortness of breath	5	2.8

More than one answer was given

Table (5): Distribution of the study subjects according to their pain management

Pain management	No.	%
Consumption of pain relieving medications(No=178)		
Yes	148	83.1
No	30	16.9
If yes (n = 148)		
Prescribed	89	50.0
Unprescribed	59	33.1
Satisfaction with pain medication (n = 148)		
Not satisfied	63	35.4
Nearly satisfied	59	33.1
Satisfied	26	14.6
Percentage of medication's effectiveness (%)(n=148)		
Min. – Max.	0.0 – 100.0	
Mean ± SD.	50.98 ±1.35	
Usage of non-pharmacological pain management# (n=178) #		
No	51	28.7
Yes,	127	71.3
Personal assistance with daily activities	42	23.6
Express feelings with others	38	21.3
walking and exercises	36	20.0
Rest periods\ sleep	34	19.1
Divert attention	23	12.9
Warm compresses	21	11.8
Elevation of the joints	8	4.5
Joints' support	7	3.9

More than one answer was given

Table (6): Distribution of the study subjects according to their pain related functional limitations (n=178)

Pain related functional limitations	No limitations		Simple		Moderate		Severe		Mean±SD
	No	%	No.	%	No.	%	No.	%	
Subdomains of pain related functional limitations									
1- Basic self-care	48	27.0	71	39.9	48	27.0	11	6.2	1.12±0.88
2- Emotional status	14	7.9	24	13.5	66	37.1	74	41.6	2.12±0.92
3- Mobility	12	6.7	20	11.2	51	28.7	95	53.4	2.29±0.92
4- Instrumental activities	16	9.0	21	11.8	62	34.8	79	44.4	2.15±0.95
5- Socialrelations	17	9.6	29	16.3	45	25.3	87	48.9	2.13±1.01
6- Sleep quality	19	10.7	28	15.7	59	33.1	72	40.4	2.03±1.0
7- Recreational activities	25	14.0	20	11.2	40	22.5	93	52.2	2.13±1.09
8- Mentalconcentration	25	14.0	48	27.0	69	38.8	36	20.2	1.65±0.96
Total levels of pain related functional limitations	**4**	**2.2**	**22**	**12.4**	**58**	**32.6**	**94**	**52.8**	**15.63±6.10**

Table (7): Relation between socio-demographic characteristics and pain related functional limitations of the study subjects

Socio-demographic characteristics	Self-care	Emotional status	Mobility	strumental tasks	Social relation	Sleep quality	Recreational activities	Mental concentration	Total score
	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.
Age									
20 – <40	1.12 ±.90	2.12 ± 0.93	2.25 ± 0.92	2.10 ± 0.96	2.10 ± 1.01	2.04 ± 1.0	2.09 ± 1.10	1.64 ±0.97	15.46 ± 6.11
40 – <50	1.05 ±0.72	2.14 ± 0.94	2.50 ± 0.91	2.45 ± 0.86	2.36 ± 1.0	1.91 ± 1.02	2.36 ± 1.05	1.68 ± 0.89	16.45 ± 6.26
≥ 60	2.0 ± 0.0	2.33 ± 0.58	2.33 ± 0.58	2.33 ± 1.15	2.33 ± 1.15	2.67 ± 0.58	2.33 ± 1.15	2.0 ± 1.0	18.33 ± 5.03
F(p)	1.586(0.208)	0.082(0.922)	0.691(0.503)	1.416(0.245)	0.721(0.488)	0.777(0.461)	0.651(0.523)	0.218(0.508)	0.533(0.576)
Sex									
Male	0.91 ± 0.87	1.79 ± 0.95	2.09 ± 1.03	2.09 ± 1.06	1.94 ± 1.07	1.59 ± 1.02	1.88 ± 1.15	1.21 ± 0.77	13.50 ± 5.96
Female	1.17 ± 0.88	2.20 ± 0.91	2.33 ± 0.88	2.16 ± 0.93	2.18 ± 0.99	2.14 ± 0.97	2.19 ± 1.07	1.76 ± 0.97	16.13 ± 6.05
t(p)	1.566(0.119)	2.339*(0.020*)	1.408(0.161)	0.393(0.695)	1.244(0.215)	2.961*(0.003*)	1.474(0.142)	3.089*(0.002*)	2.288*(0.023*)
Marital status									
Married	1.0 ± 0.84	2.03 ± 0.93	2.21 ± 0.94	2.07 ± 0.91	2.10 ± 1.01	1.92 ± 1.01	2.07 ± 1.14	1.46 ± 0.92	14.86 ± 5.94
Widow	1.30 ± 0.90	2.27 ±0.86	2.37 ± 0.88	2.28 ±0.95	2.19 ± 0.97	2.21 ± 0.99	2.21 ± 1.01	1.94 ± 0.94	16.78 ± 6.13
Divorced	1.33± 1.03	2.17 ± 1.33	2.67 ± 0.82	2.0 ± 1.55	2.0 ± 1.55	2.0 ± 0.63	2.33 ± 1.21	1.83 ± 1.17	16.33 ± 7.61
F(p)	2.570(0.079)	1.392(0.251)	1.191(0.306)	1.138(0.323)	0.213(0.808)	1.691(0.187)	0.455(0.635)	5.590*(0.004*)	2.088(0.127)

*: Statistically significant at $p \leq 0.05$ F: F value for ANOVA test t, p: t and p values for Student t-test

Table (8): Relation between duration and sites of pain and pain related functional limitations of the study subjects

Duration and sites of pain	Self-care	Emotional status	Mobility	Instrumental tasks	Social relation	Sleep quality	Recreational activities	Mental concentration	Total score
	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.
Duration of suffering from pain in years									
1-3 year	1.02 ± 0.86	1.94 ± 0.96	2.11 ± 1.02	2.0 ± 0.98	2.02 ± 1.05	1.84 ± 1.02	1.94 ± 1.11	1.57 ± 0.92	14.46 ± 6.46
>3 year	1.22 ± 0.89	2.30 ± 0.86	2.45 ± 0.78	2.29 ± 0.91	2.24 ± 0.97	2.22 ± 0.94	2.31 ± 1.04	1.73 ± 0.99	16.75 ± 5.55
t(p)	1.495(0.137)	2.596*(0.010*)	2.480*(0.014*)	2.020*(0.054*)	1.448(0.149)	2.588*(0.010*)	2.261*(0.025*)	1.049(0.296)	2.537*(0.012*)
Number of pain Sites									
Less than 3 sites	1.01 ± 0.89	1.85 ± 0.99	2.02 ± 0.99	1.88 ± 1.02	1.85 ± 1.07	1.73 ± 1.04	1.85 ± 1.16	1.37 ± 0.95	13.56 ± 6.29
3 – 6 sites	1.31 ± 0.90	2.47 ± 0.60	2.71 ± 0.57	2.53 ± 0.63	2.56 ± 0.71	2.49 ± 0.72	2.53 ± 0.84	2.07 ± 0.84	18.67 ± 4.16
More than 6 sites	1.31 ± 0.48	2.92 ± 0.28	2.77 ± 0.60	2.77 ± 0.60	2.77 ± 0.60	2.69 ± 0.48	2.77 ± 0.60	2.23 ± 0.60	20.23 ± 2.80
F(p)	2.474 (0.087)	15.669* (<0.001*)	14.241* (<0.001*)	12.999* (<0.001*)	13.775* (<0.001*)	16.201* (<0.001*)	10.414* (<0.001*)	14.195* (<0.001*)	20.543*(<0.001*)

*: Statistically significant F: F value for ANOVA test t, p: t and p values for Student t-test at $p \leq 0.05$

Table (9): Relation between pain characteristics and pain related functional limitations of the study subjects

Pain characteristics	Self-care	Emotional status	Mobility	strumental tasks	Social relation	Sleep quality	ecreational activities	Mental concentration	Total score
	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.
Frequency of pain									
More than one time per day	1.30 ± 0.85	2.48 ± 0.71	2.59 ± 0.67	2.45 ± 0.76	2.39 ± 0.87	2.38 ± 0.84	2.40 ± 0.93	1.97 ± 0.91	17.95 ± 4.68
Once per day	1.09 ± 0.95	1.83 ± 0.98	2.09 ± 0.98	2.09 ± 0.95	2.09 ± 0.98	1.83 ± 0.92	2.09 ± 1.07	1.63 ± 0.81	14.71 ± 6.13
Some days per week	0.78 ± 0.79	1.58 ± 0.97	1.78 ± 1.06	1.53 ± 1.04	1.62 ± 1.13	1.44 ± 1.06	1.58 ± 1.23	0.98 ± 0.81	11.29 ± 6.37
F(p)	5.661*(0.004*)	20.639*(<0.001*)	15.388*(<0.001*)	16.963*(<0.001*)	9.783*(<0.001*)	17.061*(<0.001*)	9.632*(<0.001*)	20.108*(<0.001*)	23.672*(<0.001*)
Types of pain									
Heaviness	1.13 ± 0.63	2.09 ± 0.95	2.22 ± 0.80	2.0 ± 0.90	2.0 ± 0.85	2.09 ± 1.08	2.0 ± 1.0	1.70 ± 0.97	15.22 ± 5.44
Dull aching	1.05 ± 0.80	2.05 ± 0.80	2.29 ± 0.78	2.05 ± 0.86	2.10 ± 1.0	1.90 ± 1.0	1.86 ± 1.24	1.57 ± 0.93	14.86 ± 5.35
Throbbing	1.50 ± 0.85	2.43 ± 0.85	2.57 ± 0.65	2.57 ± 0.85	2.29 ± 1.07	2.43 ± 0.94	2.36 ± 1.01	1.86 ± 0.77	18.0 ± 5.32
Tingling	1.07 ± 0.83	2.17 ± 0.95	2.40 ± 0.86	2.23 ± 0.97	2.23 ± 1.07	2.23 ± 0.86	2.33 ± 1.10	1.77 ± 0.90	16.33 ± 5.76
Burning	0.89 ± 1.05	1.79 ± 1.03	2.11 ± 1.10	2.05 ± 0.85	2.21 ± 0.92	1.89 ± 0.99	2.21 ± 0.98	1.58 ± 1.02	14.74 ± 6.30
Stabbing	1.15 ± 0.95	2.17 ± 0.93	2.25 ± 1.01	2.13 ± 1.03	2.10 ± 1.07	1.93 ± 1.03	2.14 ± 1.12	1.59 ± 1.02	15.46 ± 6.74
F(p)	0.839(0.524)	0.881(0.495)	0.550(0.738)	0.802(0.550)	0.242(0.943)	0.922(0.424)	0.520(0.761)	0.326(0.897)	0.676(0.643)
Severity of pain									
Mild	1.0 ± 0.82	1.25 ± 0.96	1.25 ± 0.96	1.25 ± 1.26	1.25 ± 1.50	0.75 ± 0.96	1.0 ± 1.15	0.75 ± 0.96	8.50 ± 8.06
Moderate	0.80 ± 0.85	1.65 ± 1.07	1.81 ± 1.05	1.67 ± 1.05	1.71 ± 1.0	1.62 ± 1.04	1.64 ± 1.06	1.20 ± 0.90	12.10 ± 6.29
Severe	1.34 ± 0.84	2.47 ± 0.62	2.64 ± 0.61	2.50 ± 0.68	2.45 ± 0.88	2.35 ± 0.82	2.50 ± 0.95	1.98 ± 0.85	18.22 ± 4.32
F(p)	8.738*(<0.001*)	22.319*(<0.001*)	24.868*(<0.001*)	21.731*(<0.001*)	14.600*(<0.001*)	17.202*(<0.001*)	18.003*(<0.001*)	18.650*(<0.001*)	32.003*(<0.001*)
Duration of pain per day									
Short duration	0.50 ± 0.76	1.13 ± 0.83	1.38 ± 1.06	1.13 ± 0.99	1.13 ± 1.36	0.75 ± 0.46	1.13 ±1.36	0.75 ± 0.71	7.88 ± 6.47
Moderate duration	0.91 ± 0.90	1.70 ± 0.97	1.84 ± 1.02	1.75 ± 1.01	1.81 ± 0.99	1.66 ±1.05	1.75 ± 1.09	1.30 ± 0.94	12.70 ± 6.25
Long duration	1.31 ± 0.83	2.48 ± 0.71	2.65 ± 0.61	2.49 ± 0.74	2.43 ± 0.88	2.38 ± 0.81	2.46 ±0.94	1.95 ± 0.87	18.14 ± 4.46
F(p)	6.697*(0.002*)	24.117*(<0.001*)	25.910*(<0.001*)	20.921*(<0.001*)	13.530*(<0.001*)	21.720*(<0.001*)	13.968*(<0.001*)	15.260*(<0.001*)	30.446*(<0.001*)
Factors increasing pain									
Walking for long	1.18 ± 0.85	2.20 ± 0.88	2.45 ± 0.80	2.31 ± 0.85	2.26 ± 0.98	2.14 ± 0.91	2.28 ± 1.04	1.72 ± 0.94	16.55 ± 5.56
distance	1.11 ± 0.87	2.26 ± 0.86	2.40 ± 0.91	2.34 ± 0.91	2.38 ± 0.92	2.18 ± 0.99	2.32 ± 1.04	1.72 ± 1.03	16.71 ± 6.12
Sitting for long time	1.11 ± 0.85	2.27 ± 0.83	2.57 ± 0.66	2.35 ±0.82	2.34 ± 0.95	2.17 ± 0.87	2.36 ± 0.98	1.75 ± 0.92	16.92 ± 5.04
Standing for long time	1.06 ± 0.96	2.48 ± 0.72	2.42 ± 0.76	2.35 ± 0.75	2.29 ± 0.86	2.23 ± 1.02	2.42 ± 0.85	1.61 ± 0.99	16.87 ± 4.86
Carry heavy objects	1.33 ± 0.91	2.22 ± 0.94	2.06 ± 1.11	2.06 ± 1.06	2.17 ± 0.99	2.17 ± 1.04	2.11 ± 1.13	1.44 ± 0.98	15.56 ± 5.99
Cold weather Climbing stairs	1.17 ± 0.79	2.40 ± 0.83	2.66 ± 0.67	2.43 ± 0.83	2.57 ± 0.74	2.21 ± 0.93	2.62 ± 0.74	1.81 ± 0.97	17.87 ± 5.31
F(p)	0.333(0.893)	0.841(0.521)	2.014(0.076)	0.521(0.761)	0.973(0.434)	0.069(0.997)	1.104(0.358)	0.466(0.801)	0.615(0.688)

*: Statistically significant at $p \leq 0.05$ F: F value for ANOVA test t, p: t and p values for Student t-test

Table (10): Relation between chronic pain management and pain related functional limitations of the study subjects

Pain management	Self-care	Emotional status	Mobility	ıstrumental tasks	Social relation	Sleep quality	Recreational activities	Mental concentration	Total score
	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.	Mean ±SD.
Satisfaction with pain Medication									
Not satisfied	1.24 ± 0.84	2.51 ± 0.64	2.68 ± 0.59	2.62 ± 0.71	2.75 ± 0.65	2.40 ± 0.73	2.71 ± 0.73	2.02 ± 0.85	18.92 ± 4.14
Nearly satisfied	1.03 ± 0.76	2.14 ± 0.73	2.44 ± 0.68	2.27 ± 0.69	2.32 ± 0.80	2.03 ± 0.87	2.31 ± 0.90	1.53 ± 0.82	16.07 ± 4.37
Satisfied	1.35 ± 1.09	1.92 ± 1.16	1.81 ± 1.10	1.54 ± 1.10	1.19 ± 0.69	1.96 ± 1.22	1.27 ± 1.08	1.38 ± 0.98	12.42 ± 6.17
F(p)	1.478(0.231)	6.197*(0.003*)	13.060*(<0.001*)	17.540*(<0.001*)	43.062*(<0.001*)	3.473*(0.034*)	25.689*(<0.001*)	7.164*(0.001*)	18.791*(<0.001*)
Non pharmacological pain management									
- Joints' support	1.14 ± 1.21	1.71 ± 0.95	1.43 ± 0.98	1.86 ± 0.69	2.14 ± 0.90	2.0 ± 1.15	2.14 ± 1.21	1.43 ± 0.98	13.86 ± 5.70
- Warm compresses	1.14 ± 0.96	1.81 ± 1.08	1.86 ± 0.91	1.71 ± 0.90	1.62 ± 1.02	1.86 ± 0.96	1.81 ± 0.93	1.38 ± 0.86	13.19 ± 5.92
- Exercises and mobility	0.94 ± 1.01	1.75 ± 1.11	1.89 ± 1.12	1.83 ± 1.18	1.69 ± 1.06	1.83 ± 1.13	1.58 ± 1.02	1.44 ± 1.05	12.97 ± 6.73
- Rest period\ sleep	1.0 ± 0.95	1.82 ± 1.11	2.24 ± 1.02	1.97 ± 1.14	1.82 ± 1.17	2.06 ± 1.18	1.91 ± 1.24	1.59 ± 1.18	14.41 ± 7.74
- Nothing	1.21 ± 0.78	2.33 ± 0.87	2.36 ± 0.85	2.24 ± 0.76	2.33 ± 0.87	2.07 ± 0.92	2.33 ± 0.95	1.83 ± 0.82	16.71 ± 5.58
- Raising the joints	1.0 ± 0.76	1.88 ± 0.83	2.63 ± 0.74	2.25 ± 0.71	2.50 ±0.76	2.0 ± 1.07	2.38 ± 1.06	1.13 ± 0.83	15.75 ± 5.52
- Divert attention	1.35 ± 0.88	2.04 ± 1.07	2.04 ± 1.02	2.0 ± 0.95	1.83 ± 1.07	1.83 ± 1.15	1.78 ± 1.24	1.70 ± 1.02	14.57 ± 6.73
- Express feelings with others	1.32 ± 0.96	2.0 ± 0.93	1.89 ± 0.98	1.82 ± 0.98	1.84 ± 1.03	1.79 ± 1.07	1.76 ± 1.15	1.50 ± 1.03	13.92 ± 6.90
- Depend on others for daily tasks management	1.29 ± 1.01	2.0 ± 1.0	2.08 ± 0.96	1.90 ± 0.96	1.82 ± 1.03	2.0 ± 1.06	1.88 ± 1.09	1.59 ± 1.06	14.57 ± 6.72
F(p)	0.763(0.636)	1.141(0.337)	1.723(0.093)	0.886(0.528)	1.799(0.078)	0.344(0.948)	1.556(0.139)	0.797(0.606)	1.014(0.426)
Non pharmacological pain management									
No	1.08±0.76	2.35±0.59	2.70±0.46	2.51±0.69	2.54±0.84	2.22±0.75	2.62±0.76	1.89±0.74	17.92±3.77
Yes	1.13±0.91	2.06±0.99	2.18±0.97	2.05±0.99	2.03±1.03	1.99±1.05	2.0±1.13	1.59±1.0	15.03±6.46
t(p)	0.366(0.715)	2.256* (0.026*)	4.696* (<0.001*)	2.686* (0.008*)	2.796* (0.006*)	1.254(0.212)	3.967* (<0.001*)	2.054* (0.043*)	3.504* (0.001*)

t, p: t and p values

Discussion

Rheumatoid arthritis is accompanied with chronic pain, increased medical services utilization and costs, functional limitations, and disability among patients. To what extent the patients with rheumatoid arthritis perceive chronic pain as the origin of their functional limitations still in need for more investigations[18].

So, this study aimed to determine the relationship between self-reported chronic pain and pain related functional limitations among patients with rheumatoid arthritis.

The present study result reveals that rheumatoid arthritis prevails more among females and house wives. This can be clarified by that, females are liable to more risk factors for rheumatoid arthritis than males. Reduction of estrogen level due to menopause, and increased prevalence of obesity among females are strong predisposing factors for rheumatoid arthritis. Also, house wives have greater responsibilities which necessitate over use of their joints either in their household activities, or their outside home activities suchasshopping and using public transportations that may accelerate the process of joints' cartilage degenerations. At the same time, prevalence of illiteracy among those studysubjects leads to lack of the necessary knowledge about the energy saving behaviors, joints protection techniques, or healthy life style activities to prevent musculoskeletal disorders. Also, they mayperceivetheir pain as a normal partof lifeandignore the need for medical investigations which accelerate the incidence of thedisease among them. This result supports those of Thomas et al. (2018), Srikanth et al. (2020) and Zhang et al. (2017), who reported that womengenerallyareatagreaterrisktohaverheumatoid arthritis[18-20].

The present study result reveals that study subjects inage group 20 – <40 are the most affected group by rheumatoid arthritis. This can be interpretedbythat, rheumatoid arthritis complications areincreasedwith ageing with the development of more pain and functional disabilities. So, those patients mayhavelimited ability to go to the outpatient clinics for examination or follow up because ofdifficult use of public transportation and difficult transfer. So, most of them may depend on going to any pharmacist for prescription of any medication torelieve their pain. Similar result is reported by Muraki et al. in Japan (2019)[21].

Knee, vertebrae, and ankle jointsare the most sites affected with pain as reported by the study subjects. This can be clarified by that, these joints are weight bearing joints with a greater pressure is applied on these

joints' cartilage which will enhance their further degeneration. This result is matching with Peat et al. who reported that common sites of rheumatoid arthritis pain are knee and ankle joints which are associated with low physicalfunctioning [22].

According to the current study finding, femalepatients reportedhigherlevels of pain related functionallimitations. This result can be clarified by that, the majority of the study subjects arefemales and more than two third of them are housewives. As mentioned before, housewives and females patientshave greater risk factors for rheumatoid arthritis more than males. These risk factor do not only increase the incidence of this disorderamong them, but also accelerates cartilage loss, and increase liability to more complications anddisabilitiesofthe disease, which limit their functional activities. Moreover, the pain related functional limitations among female study subjects are mainly related to emotional status, sleep quality, andmental concentration dimensions. These aspects of functional limitations may be related to the nature of female's response to painingeneral which is characterized by more emotional involvements. So, emotional disturbance due to pain among thefemalesstudy subjects will affect their sleep quality and their mental concentration. This result supports those of Murtagh etal. andLamb et al. (2019), who reported that femalespatients with persistent painmore than3 months reported higherphysicallimitations especially in their instrumental activity of daily living (IADL) compared withmales[23,24].

Widows found in the present study to have greater pain related poor mental concentrationand memorization. This may be related to the fact that widows may play their social role beside the role of their lost spouses after their death, having double responsibilities which mean greater load and duties. At the sametime, inadequate monthly income, and poor occupational status as reported by the majority of the study subjectsmayaccelerate their suffering. Also,Widows may have theircopingreserveand emotional tolerance decreased with aging process. Pain can increase theirsufferingand negatively affect their mental concentration and cognitive function. Crompton (2017) reported thatpoor monthly income, widowhood, and unemployment in females areassociated with higher functionallimitations [25].

With reference to pain duration, study subjects, who suffer from chronic pain more than 3 years, reported greater pain related functional limitations. This result may due to the negative impacts of chronic pain for long period on the study subjects' immune system, coping reserve, and quality of life.

Moreover, chronicpainfor prolonged time is associated with prolonged consumption of pain relieving medications which is characterized by its adverse side effects on their functional health. This result support Sharma et al. (2019), Sowers et al. (2016), and Litwic et al. (2018) studies' results[26-28].

According to the current study finding, it was found that as the number of pain sites increased, the study subjects' functional limitations increased. This can be justified by that study subjects whosufferfrom several joints pains may need extra doses of pain relieving medications which is usually associated with more adverse drug effects. Also, when the study subjects suffer from bilateral and several joints pain, they may cannot act or live independentlyor move freely due to pain. So, they may limit their activities to prevent episodes of pain which will induce further joint stiffness and functional limitations. This is supported by Jinks et al.(2017), Neogi et al. (2018), Cross et al. (2019), who reportedthatmore sites of pain predict greater physical limitations[29-31].

The current study result indicatesthat as the pain intensity (frequency,duration, and severity) increased, the study subjects' complaints of pain related functional limitations increased. This may be justified by the fact that greaterpain intensity may induce patients' self- imposed activity limitations to decrease occurrence of pain that is associated with movement. So, their chance to participate in recreational, social, and instrumental activities is limited. Moreover, chronic severe frequent pain may cause the study subjects to lose hope in their pain relieving that induce negative emotional status. The current study result is consistent with the results of other studies done in 2015, 2016, 2018, and2019[32-35].

Regarding the study subjects' satisfaction about their pain relieving medications, it was found that higher pain related functional limitationsare significantly associated with lower satisfaction with pain medication. This result can be clarified by that, study subjects with greater functional limitations may find no need for the consumption of their medications since they do not relieve their pains. The present study result is supported by MacLaughlin et al. who reported that medication noncompliance should be suspected in elderswho experience decline in their functional abilities[36].

According to the present study result, study subjects who did not practice any non-pharmacological pain management and depend on medications only for pain relieve show higher functionallimitations. This result can be clarified by that, despite the accessibility of several pain medications, the improvements in clinical manifestation

of rheumatoid arthritisis not satisfying for most of patients. Inclusion of non-pharmacological interventions will be helpful incontrolling rheumatoid arthritis manifestations, insuring clinical stability, decreasing potential drug side-effects, and minimizing functionallimitations.Rannou et al. reported that the non-pharmacological measures existing for rheumatoid arthritis aidinthe performance of dailyactivities[37].

Conclusion

Based on the present study results, it can be concluded that differentself- reporting of chronic pain among the study subjectscontributedtoasignificant variance in their levels of pain related functional limitations.Forillustration, higher levels of pain related functional limitations are significantly associated with the following variables; prolonged suffering from chronic pain for more than 3 years, several sites of pain more than6 joints, severe frequent pain more than once per day, persistence of painforlong duration of time per day, and managing pain with medication only without any nopharmacological interventions. Also, greater pain relatedfunctionallimitations are associated significantly with lower satisfaction with chronic painmedication.

Recommendations

Based on the findings of the present study, the following recommendations are suggested:

- Conducting a comprehensive chronic pain assessment is necessary to determine the degree of patients' suffering. This will help the nurses to predict their patients' functional status andtheirexpected participation in their care plan to manage pain.
- Identification of all factorswhich may predispose pain or increase its intensity should be evaluated carefully bythenurses and all attempts should be directed to control these factors to limit the patients' suffering and to limit their functionallimitations.
- Educational pain management guidelines for patients with rheumatoid arthritis should include thesafeuse of non-pharmacological pain management interventions, and measures to limit their functional limitations.

The future research in this field couldinclude:

Experimental studies are needed to determine the effect of pain managementnursinginterventions on functional status of patients withrheumatoid arthritis.

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