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The Relationship between Self-reported Chronic Pain and Pain related Functional Limitations among Saudi Patients with Rheumatoid Arthritis in 2024

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Abstract:
Rheumatoid arthritis patients may experience physical, social, emotional, or financial exhaustion as a result of their chronic pain. Rheumatoid arthritis patients' functioning capacities are significantly impacted by chronic pain. **Aim:** Determine the relationship between self-reported chronic pain and pain related functional limitations among Saudi patients with rheumatoid arthritis. **Subjects and method: Setting:** Rheumatoid outpatient clinics of Saudi University Hospital. **Subjects:** 178 patients were recruited. **Tools**: Three tools were used for data collection: 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 of time 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 assess patients for their pain history, and their perceived pain related functional limitations. The nurse should act collaboratively with the patients and health team membersto alleviate the patients' suffering and pains to enhance their functional abilities and todecrease their functional limitations.

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

Introduction

Morning stiffness and persistent symmetrical polyarthritis of the major and small joints are hallmarks of rheumatoid arthritis (RA), an inflammatory illness that can cause musculoskeletal disability and functional impairments (Herr., 2018; Helme et al., 2017).The burden of disease course varies and the prediction of the prognosis is difficultto estimate. In the long term, RA

reduces function which leads to difficulties of doingdaily living activities, and subsequently impact negatively on psychosocial aspect (Helme et al., 2017).

Rheumatoid Arthritis affecting 0.5 to 1% ofthe adult population of developed regionswith predominance of 2 to 3 times more infemales. It affects all age groups but ismore prevalent among 40 to 60 years people (Horgas et al., 2018). Prevalence of RA in Saudi Arabia was estimated to be 0.06% based on data from the GBD study (Almoallim et al., 2021).

Pain is characterized as chronic if persists for more than three months and usually lasts for several months or years. Multiple sites are affected by chronic pain, which typically results in a higher use of painkillers, poorer outcomes from therapies, poorer sleep, and more emotional issues. It affects everyday functioning and turns into a major complaint for a lot of patients. (Bondy&Maieses., 2019; Goldhirsch et al., 2020).

Most patients with 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 chronic pain (Martel-Pelletier et al., 2018; Corti& Rigon., 2019).

Chronic pain can restrain abilities to dodaily activities, like housekeeping, dressingor food preparation. The outcomes ofchronic pain on the functional status can bewide reaching and overwhelming ofpatients 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. Itsupposed to be the chief reasons to look formedical attention (Mallen et al., 2017; Van Dijk et al., 2016).

Managing chronic pain differ from the acute pain management where its treatment emphasizes on lowering of pain related functional limitations, reduction of emotional distress and decrease of pain. Managing chronic pain involves a comprehensive approach which is based on detailed assessment of pain and assessingits effects on functional ability (Michalos., 2016).

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 relatedfunctional limitations among Saudi patients with rheumatoid arthritis.

Research Question

What is the relationship between self-reported chronic pain and pain related functional limitations among Saudi 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 rheumatology ofSaudi University Hospital.

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 diabetes mellitus.
- Free from any acute pain conditions suchas, surgery, fracture, burn, injury, or dental problems that may alter the study subjects' perception of chronic pain related functional limitations.

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 minimalsample 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 InterviewSchedule Researchers developed this tool based on review of relevant literature to assess the socio-demographic and clinic data of the study subjects as follows;

- 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 PainAssessment of Patients with Rheumatoidarthritis Structured Interview Schedule (Young et al., 2017; Thomas et al., 2018):

This tool was developed by the researchers based on review of relevant literature to assess the history of chronic pain as perceived by the study subjects within the last week. It included questions related to:

- The duration of chronic arthritic pain inyears.
- Sites of pain.
- Type, frequency, duration (per day), andseverity ofpain.
- Presence of associated symptoms withpain.
- Factors increasing pain intensity.
- Pain management among the study subjects such as consumption of medications and its perceived effectiveness (percentages ofits effectiveness to relieve pain rangesfrom 0% to 100%) and the use of non- pharmacological pain managementinterventions.

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

This tool was developed by the researchers to assess the degree of functional limitationsdue to chronic pain as reported by thepatients with rheumatoid arthritis within thelast week. This tool covered 8 domains asfollows;

1) Basic self- care activities such as feeding and dressing, 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 andshopping respectively, 7)Recreational activities such as practicing hobbies andwatching TV, and 8) Emotional health and general feeling condition.

For each domain,the respondent were asked to indicate towhat extent their chronic

pain limits theirfunctioning this domain using a three pointsLikert scale ranged from zero (nolimitations), 1 (mild limitations), 2(moderate limitations) and 3 (severelimitations). By calculating all 8 domains, atotal pain related functional limitations index was derived. The higher the score, the greater the pain related functionallimitations. The total score was classifiedinto four levels as follows;

- No pain related functional limitations:take score of zero.
- Mild pain related functional limitations:take score of1-8.
- Moderate pain related functionallimitations: take score of9-16.
- Severe pain related functionallimitations: take score of 17-24.

Method

- Permission to carry out the study from the responsible authorities
- Permission to gather the required datafrom the head of the study setting was obtained,
- Tool I was developed by the researchers through reviewing of relevant literature toassess the socio-demographic and clinical data of the study subjects.
- Tool II, III were developed by the researchers based on reviewing the relevant literature to assess the self- reported chronic pain and pain relatedfunctional limitations of the study subjects respectively.
- Tools II and III were tested for content validity by seven experts in the related field of the study and the required modifications were done accordingly.
- Tool II and III were tested for reliability. The Cronbach's Coefficient alpha was 0.80 for tool II, and 0.76 for tool III

  A pilot study was conducted on20patientswho were selected from the study setting and were not included in the study sample. The pilot study aimed to assess the tools for their clarity and applicability and essential modifications were done accordingly.
- The researchers were available during the time of physical examination of the patients to ensure the medical diagnosis by the attending physician.

Ethical considerations

Informed witness consent was obtained from each study subject included in this study after explaining the study purpose. Anonymity and privacy of the study subjects, confidentiality of the collected data and the subjects' right to withdraw at any timewere assured.

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 determined by Cronbach's Coefficient alpha. Data were presented by descriptive statistics in the form of frequencies and percentages for qualitative variables, and arithmetic mean and standard deviation for quantitative variables. Comparison of means was doneby Student’s t test and One Way Analysis ofVariance (ANOVA). Significant differencewas considered if $p \leq 0.05$.

Results

Table (1) shows that 80.9% of the study subjects are females with their mean age was39.50± 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 livingwith

their family.

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) indicates that 32.0%, 12.4%, 11.2% of the study subjects suffer from either hypertension, heart diseases, or gastrointestinal disorders respectively.

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

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

The same table shows that 61.8% of thestudy 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% ofstudy subjects suffer from chronic arthritic pain for more than three years with a mean duration of4.74±3.55.

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 chronicpain in years	**No =178**		**%**	
1-3 year	87		48.9	
>3 year	91		51.1	

Mean ± SD.	4.74 ± 3.55

Table (4) indicates that dull aching pain andstabbing pain are the main two types of pain which reported by the study subjects as follows, 39.9%, 16.9% respectively. In addition, the higher percentages of the studysubjects experience severe pain intensity 59.0%, frequent pain more than once per day55.1%, persistence of pain for long durationper day57.9%.

Regarding factors which increase pain intensity, 79.2%, 59.6%, and 50.6%of the study subjects reported that walking for long distances, standing for long time, and sitting for long periods aggravate their pain respectively.

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

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

Table (5) shows despite that the majority of the study subjects 83.1% consume pain relieving medications and 50% of them reported that these 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 as reported by the study subjects is 50.98±31.35.

Concerning the usage of non-pharmacological pain management amongthe study subjects, 23.9% of them depend only on medications for relieving their pains,while 28.7%, 21.3%, 20.0%,19.1%used to relieve their pain by depending on personal assistance of others in managing theirdaily activities, expressing their feeling about their pain with others, walking or physical exercises, and having a period of rest or sleep respectively.

Pain management	**No.**	**%**
Consumption of pain relieving medications(No=178)		
Ye s	14 8	83.1 16.9
No	30	
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,	12	71.3
Personal assistance with daily	7 42	23.6

activitiesExpress feelings with others	38	21.3
walking and exercisesRest	36	20.0
periods\ sleep	34	19.1
Divert attention	23	12.9
Warm compresses	21	11.8
Elevation of the jointsJoints' support	8	4.5
	7	3.9

Table (6) illustrates that all domains of functional status are severely affected bypain as reported by the higher percentages of the study subjects except for basic self- careactivities domain. For illustration, self- careactivities show either no, simple, or moderate limitations due to pain among 27.0%, 39.9%, and 27.0% of the study subjects respectively. Regarding the levels of total pain related functional limitations, this table indicatesthat 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.

Pain related functional limitations	**No limitations**		**Simple**		**Moderate**		**Severe**		**Mean±SD**
	No	%	No.	%	No.	%	No.	%	
Subdomains of pain relatedfunctional 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 relatedfunctional limitations	**4**	**2.2**	**22**	**12.4**	**58**	**32.6**	**94**	**52.8**	**15.63±6.10**

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

Moreover, study subjects who are widowsshow higher pain related concentrations problems more than the others 1.94±0.94. The difference is statistically significant, F=5.59,p=0.004.

Socio-demographic 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.
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)

Table (8) shows that as the duration of suffering from pain increased for more than three years, the study subjects' complaints ofthe following pain related limitations increased; emotional disturbance2.30±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 $p \leq 0.05$. Furthermore, this table indicates that higher total pain related functional limitations 20.23±2.80 and higher levels of different domains of functional limitations are associated significantly with more sites ofpain, 6 joints and more,$p \leq 0.05$.

Duration and sitesof 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*)

Table (9) shows that, as the frequency, severity and duration of pain per day increased among the study subjects, their perception of pain related functionallimitations is increased and the differences are statistically significant p≤0.05.

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 ±	2.09 ±	2.22 ±	2.0 ±	2.0 ±	2.09 ±	2.0 ±	1.70 ±	15.22 ±

	0.63	0.95	0.80	0.90	0.85	1.08	1.0	0.97	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	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
Climbing stairs									
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)

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 measuresreported greater mean scores of overall and different domains of pain related functional limitations. The differences are statistically significant p≤0.05.

Pain management	**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.**
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 ±	1.82 ±	2.24 ±	1.97 ±	1.82 ±	2.06 ±	1.91 ±	1.59 ±	14.41 ±

- Nothing	0.95	1.11	1.02	1.14	1.17	1.18	1.24	1.18	7.74
- Raising the joints	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
- Divert attention	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
- Express feelings with others	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
- Depend on others for daily tasks management	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
	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*)

Discussion

Rheumatoid arthritis is accompanied withchronic 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 (Thomas et al., 2018).

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

The present study result reveals that rheumatoid arthritis prevails more amongfemales 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 such as shopping and using public transportations that may accelerate the process of joints' cartilage degenerations. At the same time, prevalence of illiteracy

among those study subjects leads to lack of the necessary knowledge about the energy saving behaviors, joints protection techniques, or healthy life style activities toprevent musculoskeletal disorders. Also,they may perceive their pain as a normal part of life and ignore the need for medicalinvestigations which accelerate the incidence of the disease among them. Thisresult supports those of Thomas et al.(2018), Srikanth et al. (2020) and Zhang etal. (2017), who reported thatwomen generally are at a greater risk to have rheumatoid arthritis.

The present study result reveals that study subjects in age group 20 – <40 are the most affected group by rheumatoid arthritis. This can be interpreted by that, rheumatoid arthritis complications are increased with ageing with the development of more pain and functional disabilities. So, those patients may have limited ability to go to the outpatient clinics for examination or follow up because of difficult use of public transportation and difficult transfer. So, most of them may depend on going to any pharmacist for prescription of anymedication to relieve their pain. Similarresult is reported by Muraki et al. in Japan (2019).

According to the survey participants, the most painful joints are the knee, vertebrae, and ankles. This can be explained by the fact that these joints carry weight, which puts more strain on the cartilage of the joints and accelerates their degeneration. This finding is consistent with Peat et al.'s findings that knee and ankle joints are frequently affected by rheumatoid arthritis and are linked to poor physical functioning (Peat et al., 2017).

According to the current study finding, female patients reported higher levels of pain related functional limitations. This result canbe clarified by that, the majority of the study subjects are females and more than two third of them are housewives. As mentioned before, housewives and females patients have greater risk factors for rheumatoid arthritis more than males. These risk factor do not only increase the incidence of this disorder among them, but also accelerates cartilage loss, and increase liability to more complicationsand disabilities of the disease, which limittheir functional activities. Moreover, the pain related functional limitations amongfemale study subjects are mainly related to emotional status, sleep quality, and mental concentration dimensions. These aspects of functional limitations may be related to the nature of female's response to pain in general which is characterized by more emotional involvements. So, emotional disturbance due to pain among the females study subjects will affect their sleep quality and their mental concentration. This result supports those of Murtagh etal. And Lamb et al. (2019), who reported that females patients with persistent pain more than3 monthsreported higher physical limitationsespecially in their instrumental activity of daily living (IADL) compared with males.

Widows found in the present study to have greater pain related poor mental concentration and memorization. This maybe 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. However, as noted by the majority of study participants, their poor occupational status and insufficient monthly income may exacerbate their suffering. As they age, widows may also see a decline in their emotional tolerance and coping skills. In addition to worsening their suffering, pain can impair their ability to focus and think clearly. According to Crompton (2017), women's increased functional limits are linked to widowhood, unemployment, and low monthly income.

With reference to pain duration, studysubjects, who suffer from chronic pain morethan 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, chronic pain for prolonged time isassociated with prolonged consumption ofpain relieving medications which is characterized by its adverse side effects ontheir functional health. This result supportSharma et al. (2019), Sowers et al. (2016),and Litwic et al. (2018) studies' results. According to the current study finding, itwas found that as the number of pain sitesincreased, the study subjects' functional limitations increased. This is supported by the fact that research participants with multiple joint pains could require higher dosages of painkillers, which is typically linked to more negative drug side effects. Additionally, the study participants may be unable to act, live independently, or move freely if they have pain in both or many joints. In order to avoid pain episodes that worsen joint stiffness and functional restrictions, patients might restrict their activities. According to Jinks et al. (2017), Neogi et al. (2018), and Cross et al. (2019), more pain sites indicate more physical limits.

The current study result indicates that 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 greater pain 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 intheir 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 .

Regarding the study subjects' satisfaction about their pain relieving medications, it was found that higher pain related functional limitations are significantly associated with lower satisfaction with pain medication. This result can be clarified by that, study subjectswith 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 thatmedication noncompliance should be suspected in elders who experience decline in their functional abilities.

The current study's findings indicate that participants who relied solely on pharmaceutical pain relief and did not engage in any non-pharmacological pain management practices exhibited greater functional limits. This finding can be explained by the fact that most patients are not satisfied with the improvements in the clinical manifestation of rheumatoid arthritis, even when a number of painkillers are readily available. Incorporating non-pharmacological measures will assist manage the symptoms of rheumatoid arthritis, ensure clinical stability, reduce the possibility of adverse drug reactions, and minimize functional restrictions. According to Rannou et al., non-pharmacological treatments for rheumatoid arthritis help people carry out their everyday tasks.

Conclusion

Based on the present study results, it can be concluded that different self- reporting of chronic pain among the study subjects contributed to a significant variance intheir levels of pain related functional limitations. For illustration, higher levels of pain related functional limitations are significantly associated with the following variables; prolonged suffering from

chronicpain for more than 3 years, several sites of pain more than6 joints, severe frequent painmore than once per day, persistence of pain for long duration of time per day, and managing pain with medication only without any no pharmacological interventions. Also, greater pain related functional limitations are associated significantly with lower satisfaction with chronic pain medication.

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 and their expected participation in their care plan to manage pain.
- Identification of all factors which may predispose pain or increase its intensity should be evaluated carefully by the nurses and all attempts should be directed to control these factors to limitthe patients' suffering and to limit their functional limitations.
- Educational pain management guidelines for patients with rheumatoid arthritis should include the safe use ofnon-pharmacological pain managementinterventions, and measures to limit their functional limitations.
- Experimental studies are needed to determine the effect of pain management nursing interventions on functional status of patients with rheumatoid arthritis.

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