



The Relationship between Pain Intensity, Functional Status and Quality of Life in Patients with Musculoskeletal Disorders

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Abstract

Introduction: Patients with musculoskeletal disorders have reduced quality of life secondary to pain and limited functionality. The aim of the study was to assess the relationship between pain intensity, functional status and quality of life for patients with musculoskeletal disorders.

Material and Methods: Institutional based cross-sectional study was held from April to July 2021. Pain severity and quality of life were examined using Visual Analogue Scale and short form SF-12 respectively. Functional status was examined using a structured questionnaire developed for this purpose. Data was collected using face to face interview after getting the necessary informed consent from the hospital and patients. Results were analyzed by appropriate statistical methods using SPSS version 23.

Result: Seventy patients with a variety of musculoskeletal disorders were included in the study. Pain severity was found correlated with both functional status and patient rated quality of life ($r=0.618$, $p<0.001$; $r=-0.320$, $p=0.003$, respectively). There was also correlation between functional status and quality of life ($r=-0.531$, $p<0.001$).

Conclusion: For managing and treating of patients with musculoskeletal disorders therapeutic interventions should be planned by integrating different therapeutic approaches to improve pain, functional status and quality of life along with other psychological factors.

Keywords: Functional status; Musculoskeletal disorder; Pain; Quality of life

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Introduction

Musculoskeletal Disorder (MSD) is an injury of the musculoskeletal system such as bones, muscles, joints, ligaments and tendons and related structures such as nerves and blood vessels. MSD may happen in the extremities, head, neck, or back with symptoms including pain, numbness, swelling, stiffness, and tingling [1]. The most common MSD were osteo-arthritis, rheumatoid arthritis, and psoriasis arthritis, gout, osteoporosis, osteopaths and associated fragility, fractures, traumatic fractures, back and neck pain. Pain associated with musculoskeletal problems causes medication dependence, failed treatments, suffering, social isolation and emotional distress as well as difficulties at work which all leads to decreased people's Quality of Life (QoL) In addition, musculoskeletal pain decreases professional and leisure activities and limits patients' daily functional activities. Un treated musculoskeletal pain also cause decreased appetite, irritation, sleep problems, and physiological, psychological and social consequences [2-5].

Musculoskeletal conditions affect peoples of all age group with the highest prevalence in the elder population. These disorders affect peoples in their life time with world-wide prevalence [6]. According to the latest report from the Global Burden of diseases, injuries, and risk factors MSDs coupled with osteoarthritis were the leading causes of Years Lived with Disability (YLD). The MSD's related YLD increased from 1990 to 2013 by approximately 61%. The report also highlighted that these disease conditions were not only main contributors to the burden of disease but also a crucial component of health cost in all middle income and high-income countries [7].

The incidence and progress of MSDs is multi factorial. Individual factors such as over-weight, medical history, smoking habit, physical activity and leisure time activities as well as psycho-social and organizational factor such as relationships, social support work demand and control and job security were the most common factors that predispose for MSDs. Work place physical conditions

such as work environment, extreme temperature and poor lightning were also another factors. Many studies reported that awkward and constrained work place seat postures result pressure on different regions of the body which in turn leads to the development of MSDs [6,7].

MSDs are among the most common causes of long-term disability for most patients [8,9]. Among the working population MSDs were one of the leading causes of activity-limiting diseases with a significant impact on socioeconomic status and the quality of life. These disorders drive up costs for employees, companies and the society in general [1]. Low Back Pain (LBP) alone is one of the most prevalent musculoskeletal conditions affecting peoples living in both low income and high-income countries [10,11]. LBP remains one of the costliest health problems with up to 80% of the working age (adult) population experiences at some point in their lifetime and its prevalence or incidence has been found to increase with an advance in age [10,12].

Shoulder pain and neck pain are the most common causes of morbidity and absenteeism from work in many countries. From the general MSD's, shoulder-neck pain is the specific and particular pain among the different group of working populations characterized by its multi factorial biopsychological origin and socioeconomic costs [12]. Despite that MSD's were common health problems that can lead to different personal, social and economic problems, yet no great emphasis and attention was given for these serious problems. This study intended to assess the relationship between pain intensity, functional status and quality of life for patients with MSD attending physiotherapy unit in Dubti General Hospital (DGH).

Objective

General objective

To investigate the relationship between pain intensity, functional status and quality of life for patients with musculoskeletal disorders attending physiotherapy unit at DGH, Afar, Ethiopia 2021.

Specific objective

- To assess pain severity of patients with musculoskeletal diseases.
- To assess functional status of patients with musculoskeletal disease.
- To assess the quality of life in patients with musculoskeletal diseases.

Material and Methodology

Study area and study period

The study was conducted at DGH from April 05th, 2021 to July 05th, 2021, which is found in Afar Region, north east Ethiopia. DGH is a public hospital established in 1965 and located 665 km far from Addis Ababa. The hospital has a physiotherapy unit established recently with one physiotherapy professional and one technical assistance.

Study design

Institutional based cross-sectional study was conducted to assess the relationship between pain intensity, functional status and quality of life for patients with musculoskeletal disorder attending physiotherapy DGH Afar region northeast Ethiopia.

Source population

All patients attending to physiotherapy unit with musculoskeletal disorder in the study period at DGH were source of population.

Study population

All patients with musculoskeletal disorders who were selected based on inclusion criteria from source population attending at physiotherapy unit during the study period.

Inclusion criteria

- Patients with musculoskeletal disorders, willing to participate in the study and age between 18 to 65 years were included.

Exclusion criteria

Patient with musculoskeletal disorders having additional neurological, psychological and mental problems and severely ill patient who are unable to complete the interview were exclusion criteria.

Sample size determination

Sample size for this study was determined using G-power. In order to get an 80% power of the study (true correlation) with a medium level of correlation (0.3) and 95% confidence interval and 0.05 effect size we estimate the final sample size 84. The final analysis was done on 70 respondents which gives 79.5% power of the study with 0.32 minimum correlation detected and 95% CI and 0.05 effect size.

Data collection method and procedures

Data was collected by face-to-face interview of patients at the first day of starting physiotherapy treatment. Pain was assessed by Visual Analogue Scale (VAS). VAS is an ordinal scale ranging from zero to ten, in which "zero" indicates absence of pain and "ten" indicates unbearable pain. The SF-12 is a self-reported outcome measurement tool assessing the impact of health on an individual's day to day life. It is often used to measure quality-of-life in patients with MSD. The tool consists of physical component and emotional component summary. The higher values were associated with higher quality of life and the lower values were associated with very poor quality of life. A functional status questionnaire was adopted from different literature to assess the level of patient's tolerance of activities that are routine in daily life. The score ranges from 0 no limitation at all to 6 very severe limitations.

Data quality control

In order to control and ensure the quality of data patients were interviewed in the clinical setup and questionnaires were translated to Amharic and Afar language and re translated back to English to check consistency. The questionnaires were checked for internal consistency and completeness. Data collectors have revised and reviewed the data for assurance and acceptability.

Data processing and analysis

Data was recorder and variables were prepared using excel sheet and then entering into SPSS version 23. Correlations between pain intensity, functional status and quality of life were done using Pearson correlation coefficient (r) after doing the test of normality. All the variables were found to be normally distributed. Finally, the results were prepared using tables and in text form after checking consistency.

Ethical consideration

Prior to data collection official letter from Samara University

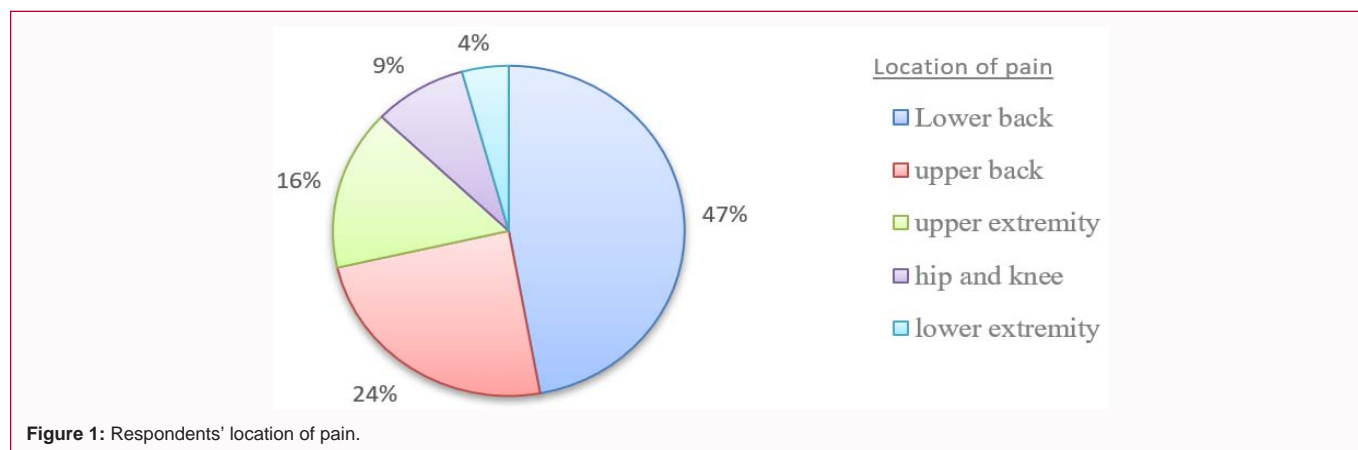


Figure 1: Respondents' location of pain.

and Dubti Hospital was obtained and all the study respondents have signed the informed consent form. Participants right to refuse or discontinue the interview was assured.

Results

A total of 70 patients fulfill the inclusion criteria and were included in the study for data synthesis. The average age of that respondent was 48.14 ± 9.66 years and the average duration of pain was 1.2 year. The occupation, religion, marital status, educational status and other socio-demographic variables of the respondent were showed in Table 1.

While assessing the location of pain or the type of musculoskeletal disorder majority 33 (47.1%) of the respondents have low back pain.

Table 1: Sociodemographic characteristic of respondents.

Variables	Frequency	Percent (%)
Sex	Male	57.1
	Female	42.9
Educational status	Never attended	38.6
	Only read and write	14.3
	Elementary school	20
	Secondary school	11.4
	College and above	15.7
Occupation	House wife	22.9
	Private employee	24.2
	Government employee	14.3
	Daily laborer	10
	Student	10
	Other	15.7
Religion	Muslim	60
	Orthodox	34.3
	Protestant	4.3
	Other	1.4
Address	Urban	62.9
	Rural	37.1
Marital status	Married	57.1
	Single	28.6
	Divorced	12.9
	Widowed	1.4

Table 2: Pain functional status and quality of life of respondents.

Variables	Mean \pm SD	Min.	Max.
Pain severity (VAS)	4.01 ± 1.546	0	6
quality of life (SF 12)	31.11 ± 6.073	20	46
Functional status	43.97 ± 8.704	22	57

SD: Standard Deviation; VAS: Visual Analogue Scale; SF 12: Short Form Quality of Life

Table 3: Correlation between pain intensity, functional status and quality of life of respondents.

r	VAS	Functional status	SF-12
VAS		0.618**	-0.320**
Functional status			-0.531**
SF-12			

** Correlation is significant at the 0.01 level (2-tailed); r: Pearson Correlation Coefficient

The prevalence or location of musculoskeletal disorders was shown in the figure below (Figure 1).

The pain intensity, functional status and quality of life of the respondents mean values were 4.01 ± 1.546 , 43.97 ± 8.704 and 31.11 ± 6.073 respectively (Table 2).

In the assessment of the correlations between pain severity, functional status and quality of life the correlation coefficient between VAS and Functional status, VAS and SF-12 and Functional status and SF-12 and their p- value was, ($r=0.618$, $P<0.0010$, $r= -0.320$, $p=0.003$ and $r= -0.531$, $P<0.001$) respectively (Table 3).

Discussions and Conclusion

This study was aimed to investigate the relationship between pain intensity, functional status and quality of life for patients with musculoskeletal disorders attending physiotherapy treatment. The mean age of respondent was 48.14 ± 9.6 represents most musculoskeletal disorder affects older people. A study conducted in Brazil showed that the mean score of age with low back pain patients was 54.2 ± 14.5 years [13]. Another study in Mallorca showed mean age of 46.57 ± 21.14 years which represents most musculoskeletal disorder affects older people [14]. One possible explanation for this may be as age increase the musculoskeletal tissue undergo reduction in tissue composition like decrease bone strength, reduced cartilage resilience, decreased ligament elasticity and loss of muscular capacity which in turn reduces tissue's ability to carry out their normal functions. The average duration of pain in this study participants was 1.92 ± 1.2 years. In a survey of chronic pain conducted in Europe,

almost 60% of participants had pain for longer than two years duration [15]. This indicates that most musculoskeletal disorder were chronic in type and requires prolonged treatment and rehabilitation.

Many studies showed that mostly affected patients in musculoskeletal disorder were female other than male. A study in Brazil showed 51.0% were female [13] and a study done in Netherlands showed 56.4% were females [16]. Our study showed that only 42.9% were females which is less than males. This might be due the higher proportion of males were smoking cigarettes and chewing chat. The systemic influence of nicotine on the spinal joints, increasing joint degeneration process, and facilitating the potential of transmission of pain impulses in the central nervous system causes the early development of MSD. Another possible justification may be the health care seeking behavior of male population might be higher than females in the area.

Most of participants (47.1%) had low back pain which makes it the most prevalent MSD in the area. This result was similar other studies which found 76.2%, in Taiwan [12] and 40.5% in Saudi Arabia [17]. These results conclude that LBP is the most prevalent MSD and much attention is needed in the treatment and management of its consequences. Our participants pain intensity was moderate (4.01 ± 1.546) which similar to findings in a study conducted in other areas [12,17,18]. Other studies found more than moderate intensity pain in a group of MSDs [19]. This shows that most musculoskeletal disorder patients have moderate to severe pain intensity.

In this study, pain intensity (VAS) and quality of life (SF-12) were correlated negatively significant and moderate intensity ($r = -0.32, P < 0.001$). A study conducted in Mallorca also found moderate intensity correlation between pain intensity and QoL [14]. Another study in Brazil also found negative but weak relationship between pain severity and QoL [13]. This correlation shows that pain intensity one of the factors that affect or decrease patients' quality of life *vice versa* and should be considered always in the management of MSD.

In this study the correlation between pain intensity and functional status is significant and moderate ($r = 0.618, P < 0.001$). Other numerous studies have also found similar findings ranging from weak to strong correlation levels [13,14,20]. Those findings suggest positive relation between pain severity and disability of the patient. If pain severity increases there is difficulty in walking, travelling, ability to sit and stand, ability of personal care (like dressing and washing) even their income also declines. Furthermore, high pain intensity was associated with reduction in both not work activities and worker effectiveness, demonstrating the far-ranging effects of pain on different aspects of daily life.

In our study, the correlation between SF-12 and functional status was $r = -0.531, p < 0.001$ similar to other study. A study conducted on adhesive capsulitis patients also found moderate correlation between quality of life and functional status [21]. Another study in Thailand found correlation between VAS and Euro QoL in patients with rheumatoid arthritis [22]. These findings shows that there is correlation between functional status and quality of life if the patient not affected from his daily activity due to emotional, physical and psychological problem their disability of patient is improved and *vice versa*.

From this study, we conclude that pain severity is negatively correlates with quality of life and positively correlates to functional disability, quality of life negatively correlated to functional disability,

suggesting that measure to promote the improvement of functional capacity and decreases pain may leads to better quality of life patient with musculoskeletal disorder. This study was limited to out-patients attending physiotherapy only; and the results are not necessarily generalized to other settings such as in-patients. In addition, the number of participants is small which might affect the final results.

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