

Relationship between Intensity of Pain, Depression Level and Quality Of Life in Geriatric Population Suffering From Different Regional Pains.

Shah, D.; & Bhatt, S.

Article Authorship & Affiliation Details

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Shah, D., Assistant Professor, Ashok & Rita Patel Institute of Physiotherapy, CHARUSAT, Changa, Anand-388421, Gujarat, India. Email: shash.physio@gmail.com

Bhatt, S., Post-graduate student, MPT (Paediatrics), Ashok & Rita Patel Institute of Physiotherapy, CHARUSAT, Changa, Anand-388421, Gujarat, India.

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Abstract

Background: Disability, painful joints and depression becomes common in geriatric patient. There are many regional painful joints which are common in this age-group owing to degenerative process. **Objectives:** This study aims to detect which regional pain contributes most for the depression and how pain influences the level of depression and the quality of life in geriatrics. **Methodology:** Study was conducted on 60 subjects; above 60 years of age and divided into 4 groups based on their location of pain. Each group was assessed for pain intensity using Numeric Analogue Scale (NAS), quality of life using EQ-5D scale and depression using Geriatric Depression Scale (GDS). **Result:** Strong correlation ($p < 0.05$) between NAS and GDS in neck pain and back pain group. Strong co-relation ($p < 0.05$) existing between NAS and EQ-5D in neck pain and knee pain group. Correlation between GDS and EQ-5D was very strong ($p < 0.05$) for knee pain group. **Conclusion:** Pain has strong influence on depression and poor quality of life in geriatric population suffering from neck/shoulder/back/knee pain. Depression and reduced quality of life was correlating with all the 4 conditions in a range from negligible to strong.

Introduction

Pain is recognized as a very common problem for geriatric population, with persistent or bothersome (chronic) pain affecting more than 50% of older people living in a community setting and greater than 80% of nursing home residents. While chronic pain is prevalent among older adults, it is not a normal part of aging. Rather, physical pathology and/or psychopathology are always involved.

Common age-associated psychosocial issues e.g., loss of family and friends, retirement from the workforce, bereavement, loss of independence/institutionalization may influence the expression, maintenance, and treatment of pain. There are several self-report pain assessment tools available that have demonstrated reliability and validity for use in older adults (e.g., verbal descriptor scales, numeric scales, and faces scales). Moreover, elderly people with

dementia can also use such scales in an appropriate fashion, although one may need to solicit the report of pain. Other psychological factors expected to be influenced by pain have to be also assessed like depression (including suicidal risk), anxiety, sleep disruption, appetite disturbance/weight loss, cognitive impairment, and interference with performance of activities of daily living *Charlton, (2005)*. *Jagga et al (2011)* have reported changes in nerve conduction properties especially in reference to the anthropometric changes with age. *Pruthi & Multani (2012)* have reported changes in lung functions with aging.

As per World Health Organization (WHO), Depression is a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration. Sadness is a natural part of life. But when the sadness persists and interferes with everyday life, it may be depression. Depression is not a normal part of growing old (*WHO, .*). When depression occurs in late life, it sometimes can be a relapse of an earlier depression. But when it occurs for the first time in older adults, it usually is brought upon by other medical illnesses. The depressed person suffers from symptoms that interfere with his or her ability to function normally for a prolonged period of time. Untreated depression can lead to disability, worsen symptoms of other illnesses, lead to premature death and can also result in suicide. Changes as the result of aging, medical illnesses or genetics may put the

older adult at a greater risk for developing depression.

There are many instruments available to measure depression, the Geriatric Depression Scale (GDS), first created by *Yesavage, et al. (1983)*, has been tested and used extensively with the older population. A Short Form GDS consisting of 15 questions was developed in 1986. Questions from the Long Form GDS which had the highest correlation with depressive symptoms in validation studies were selected for the short version. Of the 15 items, 10 indicated the presence of depression when answered positively, while the rest (question numbers 1, 5, 7, 11, 13) indicated depression when answered negatively. Scores of 0-4 are considered normal, depending on age, education, and complaints; 5-8 indicate mild depression; 9-11 indicate moderate depression; and 12-15 indicate severe depression. GDS is found to have 92% sensitivity and 89% specificity when evaluated against diagnostic criteria. The validity and reliability of the tool have been supported through both clinical practice and research *Greenberg (2011)*.

It is well known that chronic pain is the commonest cause for depression in geriatric population. Hence this study includes Numeric Analogue Scale (NAS) to quantify the pain and to detect how much is its influence on the level of depression. NAS for pain is one-dimensional measure of pain intensity in adults including those with chronic pain. Although various iterations exists, the most commonly used is 11 items NAS. Validity testing showed high correlations, $r = 0.90$ for NAS (*Flaherty, 2012*). Test-

retest reliability for NAS for geriatrics ranges from 0.57 to 0.83. Overall strength of this scale is its ability to quickly and reliably screen for pain (Greenberg (2011). For cognitively intact older adults the NRS is the most widely used tool (Horowitz et al, 2010).

Moreover it is being believed that the chronic pain also affects the quality of life of the person. Considering this aspect of the pain, one of the scales included in the study was EQ-5D which measures the quality of life of the person and quantifies it. Test-retest reliability of the EQ-5D is very high ($r \geq 0.85$) (Bair et al, 2003). EQ-5D is a very useful measure because it can be used directly to measure utilities in cost-effectiveness studies. Hence the aim of the present study was to find out the relation between the intensity of pain, depression level and quality of life in geriatric population suffering from neck pain, shoulder pain, knee pain and back pain respectively.

Materials & Methods

The present study was a correlation study with study participants of ≥ 60 years of age and suffering from any (and only) of these pain i.e.: neck pain, shoulder pain, back pain, knee pain. The participants were then divided into 4 equal groups of 15 subjects in each group. In view of the inclusion and exclusion criteria, convenient sampling method was selected. The inclusion criteria consisted of i. Age: ≥ 60 years, ii. Suffering from any (and only) of these pains i.e.: neck pain, shoulder pain, back pain, knee pain, iii. Conscious and oriented to time, place and person, iv. Knowledge of Gujarati, Hindi, English language. The exclusion criteria

consisted of association with other musculoskeletal, neurological and cardio-respiratory diseases and acute exacerbation of any condition and on medication.

After recruitment, each participant was made aware about the aims and objectives of the study. The scales were explained to the patient in their languages and their verbal consent was taken. Each group was then assessed for the following outcome measures: a. Pain intensity using Numeric Analogue Scale (NAS), b. Depression level using 30 points Geriatric Depression Scale (GDS), c. Quality of Life using EQ-5D Scale.

Results & Discussion:

Table 1 : Correlation amongst NAS, EQ-5D and GDS for Neck pain

Outcome measure	r value	p-value
NAS & GDS	0.85	0.00003
GDS & EQ-5D	0.37	0.08
NAS & EQ-5D	0.52	0.02

Table 2: Correlation amongst NAS, EQ-5D and GDS for Shoulder pain

Outcome measure	r value	p- value
NAS & GDS	0.89	3.4
GDS & EQ-5D	0.25	0.19
NAS & EQ-5D	0.4	0.07

Table 3: Correlation amongst NAS, EQ-5D and GDS for Back pain

Outcome measure	r value	p-value
NAS & GDS	0.85	0.00003
GDS & EQ-5D	-0.06	0.4
NAS & EQ-5D	0.08	0.4

Table 4: Correlation of knee pain outcomes

Outcome measure	Outcome measure	r value	P
NAS	GDS	0.9	2.3
GDS	EQ-5D	0.7	0.002
NAS	EQ-5D	0.65	0.005

Table 5: Data describing mean score of NAS, GDS and EQ-5D of all four groups in percentage

Pain	NAS (%)	GDS (%)	EQ-5D (%)
Neck pain	38	37.1	47.53
Shoulder pain	34.7	35.1	55.53

Back pain	43	49.33	58.2
Knee pain	44.7	40.69	58.67

This study had sample size of 60 with the age ≥ 60 years. These subjects were those suffering from any (and only) of these conditions i.e.: neck pain, shoulder pain, back pain and knee pain. These subjects were divided into 4 groups based on their area of pain with 15 subjects in each group. These subjects were then assessed for pain intensity using Numerical Analogue Scale, for depression level using Geriatric Depression Scale and for Quality of Life using EQ-5D scale. The statistical correlation amongst all these 3 variables was then found in each group and compared amongst groups.

It is widely being known that pain does have influence on incidence of depression in an individual. Moreover, when a person falls in geriatric age group, the depression becomes obvious. There are number of theories that explain the relation between these two variables (i.e.: pain and depression) and also many researches that support this fact. However, most of such researches explain such relation considering single disease or pain. One of such studies states that the higher the neck pain level, the more is the psychosocial distress (Hilderink et al, 2012). Other study claims that there is high prevalence and close relationships of depression, anxiety, and sleep disturbance in patients with shoulder pain for 3 months or longer (WHO,). A study for back pain states that combination of chronic back pain and major depression was associated with greater disability than either condition alone, although pain severity was found to

be the strongest overall predictor of disability (Hilderink et al, 2012).

Comparison of relation between pain and depression amongst different regional sites of pains is new to explore. Moreover, finding the effect of pain and following depression on quality of life is also new. This research had been framed with the aim of exploring this untouched area. Widely practised concept in physiotherapy works on reduction of pain and treating physical condition. But now this concept is being gradually changed to bio-psycho-social model. This model supports influence of psychological and social factor along with physical impairments on an individual's functional level.

This study explains the interrelation amongst pain, depression and quality of life. The relation among GDS, NAS and EQ-5D is detected for each of 4 different regional pains groups (i.e.: neck pain, shoulder pain, back pain, knee pain). Moreover, each of these variable was compared internally amongst 4 groups. Pearson's correlation was used to detect the statistical correlation. From the interpretation of the obtained results, it was found that, there was a very strong correlation ($r \geq 0.7$) existing between NAS and GDS in all four groups. Possible reason for such high correlation could be explained by one of the studies which states that depression is closely associated with patients with more pain complaints, greater pain intensity or longer duration of pain. Depression complicates the management of patients with pain and is associated with poorer outcomes and greater likelihood of no-recovery. Additive impairments in social function, work

function, and functional limitations (e.g., limited mobility and restricted activity) are also seen when higher pain exists and this ultimately that may be the cause for higher level of depression (Hilderink et al, 2012).

Strong relation ($r = 0.4 - 0.69$) exists between NAS and EQ-5D in all groups except one with back pain. In back pain r value being 0.08 was considered as no correlation or negligible correlation. The reason for this could be that the 2 components of EQ-5D i.e.: mobility and self care (mainly emphasising on bathing and dressing) are minimally found to be interfered in back pain cases.

The correlation between GDS and EQ-5D is very strong ($r \geq 0.7$) for knee pain, moderate ($r = 0.3 - 0.39$) for neck pain, weak ($r = 0.2 - 0.29$) for shoulder pain and no correlation ($r = 0.01 - 0.19$) for back pain.

P-value was checked for each correlation to look for its level of significance. The obtained result stated that the correlation coefficient is highly significant between NAS-GDS and NAS-EQ-5D in neck pain group. This could have been because the activities which were considered in the GDS and EQ-5D were based on our daily routine which has good amount of neck movements alone and its posture variation to meet the demands of the activity. Hence the patients would have found it to be highly disabling and also reducing their quality of life (Scott and Sullivan, 2012; Cho et al, 2013).

In shoulder pain group none of the obtained correlation coefficient value was found to be significant. This group having very low mean NAS score (3.47/10; least amongst all groups) could be the reason for

obtaining non-significant p-value as pain is considered to be the prime factor leading to depressive state and ultimately poor quality of life (Rezai, Met. et al, 2009; Kim et al, 2011;).

In back pain group, significant relation was found only between NAS-GDS which could have been because patients with back pain had severe pain ratings on NAS which could have been the principle factor affecting the depression level in our subjects (Montazeri, and Mousavi, 2010).

In knee pain group, p-value was highly significant for GDS-EQ-5D and NAS-EQ-5D with strong correlation coefficient. Indian set-up requires many activities to be done in a way which puts maximum stress on the knee joints with highest prevalence rates of OA knee in the age-group of 50-70 years. As our subjects were also falling under the same age criteria this would have led them to more depressed state and ultimately poor quality of life. Moreover, it is very well known that more the pain is more is the interference with the activities of daily living and ultimately causing negative effect on quality of life (Kim et al, 2011).

Moreover from the graphical representation of NAS scores of all 4 groups, it had been found that highest score was of knee pain group with mean score of 4.47/10 (SD=2.06). The score of GDS was maximum for back pain with mean=14.8/30 (SD=8.31). And considering Quality of Life data (EQ-5D), it could be perceived that the maximum affection was in the group with knee pain with mean score of 8.8/15 (SD=1.87). Maximum score of EQ-5D in knee pain

group could be explained by one of the studies that states that independent of knee OA and other confounding factors, subjects with knee pain had more than 5-fold increase in the risk of belonging to the worst lower extremity function compared to subjects without knee pain (Giesecke et al, 2005). Maximum of our everyday functions comprises of either sitting or standing, and doing those activities for prolonged duration can aggravate the symptom of pain when specifically knee is involved. This could have been the possible reason for having maximum score of EQ-5D as well as NAS in knee pain group.

EQ-5D was decided to be taken as one of the outcome measures for this study considering its components and high validity and reliability. Out of all, 3 components (i.e.: Usual activities, Pain/Discomfort, Anxiety/Depression) could be applied to any group. Out of remaining 2, one (i.e.: mobility) was more applicable to lower limb functioning which is mainly found to be affected in knee and back pain cases. And the remaining one component (i.e.: self care - mainly emphasizing on dressing and bathing) is applicable to upper limb functioning which is mainly found to be affected in shoulder and neck cases.

Conclusion: It is concluded that the pain intensity does have strong influence on incidence of depression and poor quality of life in geriatric population suffering from neck/shoulder/back/knee pain. Depression and reduced quality of life was found to be correlating with all the 4 conditions in a range from negligible to strong. This might have been because the

activities i.e. ground-level and bending forward form a very important component in Indian society and an inability to do such activities could have given rise to depression and an increased learned dependency on others. However the results of this study have to be implied with great care as there was a sample which was under this study and further researches in this field with larger sample size are warranted. Also, after establishing the relation between pain, depression and quality of life, interventional studies covering treatment of depression and improvement of overall quality of life should be emphasised as a part of comprehensive physiotherapy rehabilitation.

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Conflict of Interest None Declared