

AN EXPERIMENTAL STUDY TO ANALYSE THE INFLUENCE OF DIMENSIONS OF PERSONALITY OF BIG FIVE ON THE SCORES OF ROUTINE ASSESSMENT OF PATIENT INDEX DATA (RAPID 3) OF PATIENTS SUFFERING FROM LOCALISED NON ARTICULAR RHEUMATISM OF UPPER AND LOWER LIMB

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ABSTRACT

Localised non-articular rheumatism is a group of conditions that affects structures such as tendon, fascia, bursa and ligaments manifested as pain, functional disability and resultant alteration in mental status. The study aims to analyse the influence of dimensions of the personality of big five on the scores of Routine Assessment of Patient Index Data (RAPID 3) of patients suffering from localised non-articular rheumatism of upper and lower limb. Multiple linear regression analysis results show that dimensions of the personality of big five have an overall influence on RAPID 3 scores before treatment to a significant level of the p-value of <0.05 level. The dimension of personality extraversion has a direct influence while neuroticism and openness has an indirect influence on scores of Routine Assessment of Patient Index Data before treatment in patients suffering from the localised non-articular lesion. The study concludes that there is a definite and significant influence for the dimensions of personality to the sufferings of patients with non-articular rheumatism of upper and lower limb.

Keywords: Big-five, Localised non-articular rheumatism, Routine assessment of patient index data (RAPID 3), multiple linear regression analysis

Introduction

Non-articular rheumatism is a broader term used to designate a group of disorders that affects structures around the joints such as tendon, enthesis, bursa, ligaments, and fascia. It may be general or localised; the latter category is affecting a particular area and specific in their presentation. It is designated as soft tissue rheumatism and overuse syndromes also. Non-articular rheumatism is one of the most prevalent musculoskeletal disorder. In a WHO-ILAR COPCORD adult population-based study the prevalence percentage of non-articular lesions in India is 3.77% among the rural population and 1.2% in urban population Chopra (2013). Chopra (2013) reports 11% of patients having soft-tissue rheumatism suffered from a moderately severe disability score. In an Indian study, Chopra (2015) by using COPCORD index point out that non-articular rheumatism accounts for 1.39 of all musculoskeletal burden.

The main regional affection sites of upper and lower limb non-articular rheumatism are shoulder, elbow, ankle and foot. Affection in the soft tissues in these areas may cause pain, functional disability and resultant

psychological distress. A peep into the regional pain syndromes in respective areas with its incidence and disability burden will give a gravity of the impact of soft tissue affection in the community.

Shoulder pain is an important periarticular lesion-affecting people to a major extend. The prevalence reported in a general population ranges from 7-28%, according to Roe et. al.(2013). Two important conditions that affect the elbow region mainly due to occupational or recreation activities are lateral and medial epicondylitis. In a review article Waseema et. al, (2012) explains that lateral epicondylitis in a general population in India is 1 to 3%. The conditions that affect ankle presents pain as the main symptom. It is experienced by 11.7% of people in a community. It is identified by Harrison-Blount et al (2017) that most common complaint of the foot in India is a pain in the heel and which accounts for 18%. Plantar fasciitis is the most important condition that causes heel pain.

This report on epidemiology and disease burden shows that localised non-articular lesion is an ongoing challenge and require active consideration because the number of

cases is increasing alarmingly and the suffering years due to disability is also gradually increasing. It not only affects the functional ability of the patient but also causes a burden to the family and community as well.

The main risk factors for the development of non-articular rheumatism includes repetitive movement of the parts and heavy forceful exertions as a part of the occupation. Sports and recreational activities are also one of the major issues that provoke affections in soft tissue. However, recent researches direct the attention that the constitutional disposition and psychosocial factors in interpersonal and community settings have a direct role in the initiation and progression of the disease apart from the physical factors alone.

Now a day it is more clearly perceived that the intensity and severity of the functional disability and pain also depend upon the psychological aspect of the person concerned, in contradistinction to the earlier belief that it depends on physical damage only. Careful studies on the subject reveal that multiple and varied psychological factors are working as aetiologies and triggering factors for the development of the non-articular lesion. Personality characters such as feeling personality, outward behaviour, low esteem, and continuous mental stress have a contributory role in musculoskeletal disorders.

There are different methods to study the constitutional disposition and psychological characters. Personality based study is one among them. It is reported by personality psychologists that trait theory of personality is one that relates inner tendencies of behaviour with the physical and social environment. To trait psychologists, personality is 'personality is a set of psychological traits and mechanism within the individual that are organised and relatively enduring that influence his or her interactions with and adaptations to the intrapsychic, physical and social environment' Larsen & Buss (2005).

The most refined trait theory of personality is the five-factor model. The five dimensions of the big five are extraversion, conscientiousness, agreeableness, openness to experience and neuroticism. Psychologists believe that the five-factor model is the major

structure underlying many existing personality inventories. They help to identify the influence of personality on the predisposition of diseases.

Influence of personality on musculoskeletal disorders

There are studies available on the influence of personality on musculoskeletal disorders in general and trait theory in particular. In a study of 'Prospective association between personality traits and persistent pain and opioid medication use,' Sutinet. al. (2019) stick to the argument after a ten year follow up that high neuroticism was associated with pain and opioid use. Persons who show repeated anxiety and nervousness are prone to develop arthritis in middle age confirms the study by statistical analysis by Harris et al (2012). Nimberte et al (2012) in their study reports persons who are feeling personality has shown proneness to musculoskeletal disorders than persons who keeps a thinking personality.

In a study to predict the probability of influence of personality and musculoskeletal disorders using Goldberg's big five-personality scale, Ahmadi et al. (2016) narrate that wrist problems are seen in persons with extraversion whereas agreeableness and emotional stability is associated with shoulder and ankle pain. Toleaet. al. (2012) observe that muscle strength and physical activity are directly correlated and which leads to the development of musculoskeletal disorders in later life. In this study, the personality study was done with the five-factor model.

Oron & Reichenberg (2003) predict an interesting interpretation of the influence of extraversion in musculoskeletal disorders in an article. They say people with high extraversion are showing a preference for dominance, thereby they are active, assertive and energetic. Being they are overactive, they will overstrain and show a proneness to musculoskeletal disorders. The second reason being talkative, extraversion people will report their discomfort in the initial state itself.

Influence of personality on non-articular lesion

To identify periarthritic personality using NEO FFI on shoulder pain patients showed a result that openness to experience was in increased

score in patients of the frozen shoulder due to idiopathic causes whereas conscientiousness and extraversion were high in patients having the disease secondary to diseases like diabetes. The same study conducted in 118 patients showed no significant influence by neuroticism as expected says Debeer et.al. (2013). Aben et al (2018) based on Big Five inventory assessed that personality traits such as extraversion and agreeableness showed lower score in persons with tennis elbow.

Apart from the five-factor model, other reports are available on the influence of personality factors on the non-articular lesion. Some studies express the view that extroversion is related to the non-articular lesion. Bru et.al. (1993) finds that extroversion are mediators of neck and shoulder pain in 586 female hospital staff when the study was conducted with Eysenck's personality questionnaire. Another report is on the anterior knee pain is seen more in persons who are having high hostility, aggression and no signs of depression, according to the study by using MMPI by Witonski et.al. (1998).

But studies in literature search also shows that neuroticism dimension or factors related to it such as depression, anxiety stress etc. are in the forefront component in the affection of non-articular lesions. Drake. et.al. (2018) presents in a review article that there is an unimportant association between plantar heel pain and depression anxiety and stress. The association of personality traits in individuals with chronic pain in the foot and ankle disorders recorded by Shivarathre et.al.(2014) using Eysenck personality questionnaire in 90 participant's points out that persons with diseases in these areas have higher neuroticism score than the control group.

In a study on military persons, it was reported that younger group of persons also affected with lateral epicondylitis indicating that increased demand of upper extremity use is directly proportional to the risk of developing epicondylitis than affecting insertion tendinopathies of older age as reports says by Wolf et.al. (2010).

All most all studies keeping the same reservations that the repetitive and forceful activities, especially in younger age group and

working class, is the main risk factors for the development of medial and lateral epicondylitis and in the latter in particular who show an industrious nature. It is noted that an ankle sprain is mostly seen in younger age, active persons like athletes, military persons, dancers, and all types of indoor sports persons. The prevalence of heel pain is higher in manual labourers and persons who engage in activities at the age between 25-65 years Kennady (2019).

Materials and methods

Study design

The research design is an experimental design.

Sample

Samples for the experimental study has collected from the Outpatient department of Dr Padiar Memorial Homoeopathic Medical College Chottanikkara, Ernakulam. The random sampling method is used to collect samples. Thirty clinically diagnosed cases of the periarticular lesion are taken up for the study of the influence of personality on the routine assessment of patient index data. The sample size was estimated for this particular study after a pilot study on the influence of personality in all musculoskeletal disorders.

Approval of the ethics committee

The study protocol has examined and approved by the institutional ethics committee as well as the ethics committee of the School of Behavioural sciences.

Inclusion criteria

Patients who confirmed for the clinical diagnostic criteria of non-articular lesion alone are included for study and patients of both sexes were included in the study.

Exclusion criteria

Patients who were unwilling to opt personality-based study were excluded from the study and persons who were suffering from affections of bursitis were excluded from the study.

The tool used for the study

1. Routine Assessment of Patient Index Data (RAPID 3) on Multi-Dimensional Health Assessment Questionnaire (MDHAQ)

RAPID 3 on MDHAQ is an index of three important measures such as physical function, pain and patient global estimate on the status of the patient. It is a baseline measurement to support and complement clinical impressions of all rheumatic disorders. Routine Assessment of Patient Index Data (RAPID 3) score is the sum of all the three vital status of the measurements used in rheumatic care.

2. Big Five Inventory (BFI)

It is a measure of personality using 44 items to designate five dimensions.

Procedure

The physician completes the scoring sheet of RAPID 3 on MDHAQ during the first visit of the patient. RAPID 3 is a cumulative score of three vital signs such as function, pain and patient’s present status of how he feels. This score is recorded on the 0-10 scale.

Using the Big Five inventory the characters of the person is assessed by using the syntax. This

will be represented as BFI extroversion score, BFI agreeableness score, BFI conscientiousness score, BFI neuroticism score and BFI openness to experience score. **Statistics** Multiple linear regression analysis was done to find out the influence of dimensions of personality on the Routine Assessment of Patient Index Data. The analysis was worked out using the Statistical Package for Social Science (SPSS) version 20.

Results

Table 1. Results of multiple linear regression analysis to estimate the overall influence of personality based on big five inventory on the mean score of Routine Assessment of Patient Index Data (RAPID 3) before treatment in 30 patients suffering from the localised non-articular lesion. ANOVA of regression, the sum of squares, degrees of freedom, mean square, F value and p-value

| Anova of Regression | Sum Squares | Degrees of Freedom | Mean Square | F | p-value |
|---------------------|-------------|--------------------|-------------|-------|---------|
| Regression | 76.992 | 5 | 15.398 | 2.929 | 0.033 |
| Residual | 126.182 | 24 | 5.258 | | |
| Total | 203.175 | 29 | | | |

The F value and p-value on Table 4 .16 on multiple linear regression analysis on overall model reveals that the dimensions of personality have a significant influence on Routine assessment of patient index data before treatment in patients suffering from the non-articular lesion. This implies a meaning that dimensions of personality have a definite influence on patients suffering from the localised non-articular lesion of the upper and lower limb.

Table 2. Results of multiple linear regression analysis to estimate the influence of personality

dimensions based on a mean individual score of each dimension of big five inventory on the mean score of routine assessment of patient index data (RAPID 3) before treatment among 30 patients suffering from the non-articular lesion.

Mean of Routine assessment of patient index data before treatment, Standard deviation, Dimensions of personality, Individual regression coefficient, Standard error and t value

| N | Rapid3 Mean | SD | Dimensions of Personality | Regression Co-Efficient | Standard Error | T | P |
|----|-------------|------|---------------------------|-------------------------|----------------|--------|-------|
| 30 | 8.65 | 2.64 | Extraversion | 1.72 | 0.821 | 2.095 | 0.047 |
| | | | Agreeableness | -1.157 | 0.737 | -1.568 | 0.13 |
| | | | Conscientiousness | 0.605 | 0.645 | 0.938 | 0.358 |
| | | | Neuroticism | -1.526 | 0.596 | -2.562 | 0.017 |
| | | | Openness | -2.765 | 1.136 | -2.434 | 0.023 |

The RAPID 3 is taken as a dependant variable and dimensions of personality as independent variables. The t value and p-value on Table 2 on multiple linear regression analysis with individual regression coefficient value reveals that the dimensions of personality extraversion have a direct influence while neuroticism and openness has an indirect influence on Routine assessment of patient index data before treatment in patients suffering from the non-articular lesion. However, dimensions of personality agreeableness and conscientiousness have no significant influence on Routine assessment of patient index data before treatment in patients suffering from the localised non-articular lesion of the upper and lower limb.

Discussion

An important study conducted by a team of researchers including Paul T Costa the high authority of five-factor model, on the association between personality dimensions and muscle strength in 1220 persons identified that neuroticism is negatively correlated and extraversion is positively correlated to muscle strength. In the same study, they identified that muscle strength and physical activity is directly correlated with disabilities and musculoskeletal disorders. It can be assumed that proneness to musculoskeletal disorders is more in patients with increased extraversion dimension and less proneness in patients with more neuroticism dimension.

Ovan Yahav & Reichenberg (2003) in this regard make almost the same observations. They point out that extraversion people are active and they are involving much in physical activity are more prone to lesions. The same article observes that extravert people will express their symptoms easily so that reporting of their complaints will be more early and in the initial stage itself. Wifonski (1998) reveals the result that patients with patella-femoral and anterior knee pain showed high aggression but no signs of depression. An important study conducted by Debeer (2018) with NEO FFI on frozen shoulder presented a picture that higher score on conscientiousness and extraversion by patients having frozen shoulder with diabetes.

The findings obtained as far as extraversion and neuroticism dimensions concerned in non-

articular rheumatism of this particular research study matches with the study lead by Tolea (2012), Yahav & Reichenberg (2003), Wifonski (1998), Debeer (2018) and confirms the findings.

A good number of studies reflect the fact that neuroticism is showing a negative correlation to most musculoskeletal disorders having a general nature such as fibromyalgia or chronic fatigue syndrome. However, dimension neuroticism is showing no definite relationship with the localised non-articular diseases according to some studies. However, this particular study results exhibit that dimension neuroticism if increased has a chance of decreasing the scores on the routine assessment of patient index data. This is not in tune with many related studies except the study team including Paul Costa. The increase of neuroticism decreases the chance of localised non-articular lesions may be due to fact that high neuroticism persons will shun themselves away from the rigorous physical activities and overstraining themselves that reduces the chance of being injured.

The literature study related to openness dimension is even less few and they show that when openness is increased there is a chance of increased non-articular lesion. However, this particular study shows a different result that openness is negatively influencing the scores of routine assessment of patient index data. It is assumed that openness people will try new techniques and procedures for reducing the stress of physical activities. They will not consider their job as a burden otherwise also. Therefore less chance of affection in persons who are showing the dimension openness to experience. Valid report on the association between agreeableness and disease activity shows results that it has no direct influence on disease activity of a localised non-articular lesion. This study also stands close to the same findings of previous studies. As far as the last dimension conscientiousness is concerned this study shows no influence on the scores of Routine Assessment of Patient Index Data that is also a result observed in most of the studies.

Conclusion

The research study concludes with the remark that there is a definite and significant influence for the dimensions of personality to the sufferings of patients with non-articular rheumatism of upper and lower limb.

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