ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

Be Brave and Cool, Be Far from Low Back Pain: Kinesiophobia and Pain Catastrophizing Behaviour Can Cause Disability in Chronic Non-specific Low Back Pain Patients Like the Other Maladaptive Psychosocial Factors

Cesur ve Sakin Ol, Bel Ağrısından Uzak Ol: Kinezyofobi ve Ağrıyı Felaketleştirme Davranışı; Kronik Nonspesifik Bel Ağrılı Hastalarda, Diğer Maladaptif Psikososyal Faktörler Gibi Engelliliğe Yol Açabilir

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ABSTRACT Objective: The aim of the study is to research the effect of kinesiophobia and pain catastrophizing behavior on disability related to low back pain among patients with chronic non-specific low back pain. **Material and Methods:** In this prospective and cross-sectional study, in which the data of 54 patients in total were recorded with 3 stages of patient recruitment; the data of kinesiophobia (with Tampa Kinesiophobia Scale), catastrophe (with Pain Catastrophizing Scale) and low back pain-related disability level (with Oswestry Disability Index) with sociodemographic and anthropometric data were analyzed. By means of statistical analysis; continuous variables were expressed with mean value±standard deviation and median value (minimum-maximum) and categorical variables were expressed in terms of numbers and percentages. The Pearson and Spearman correlation coefficient was used to evaluate the correlation of the variables. The correlation coefficient of 0.00-0.30 was considered as negligible, 0.30-0.50 as low, 0.50-0.70 as medium, 0.70-0.90 as high, and 0.90-1.00 as very high. **Results:** A moderate positive correlation was identified between kinesiophobia and catastrophizing with disability level related to low back pain. There was a low-degree negative correlation between disability level related to low back pain with education and income level. **Conclusions:** Psychosocial pathologies like kinesiophobia and pain catastrophizing behavior may affect disability related to low back pain in a negative sense. In addition to the pathoanatomic/biomedical approach, treatment should include a psychosocial-based assessment and if psychosocial pathology is identified, treatments like pain education and cognitive behavioral therapy should be added to present treatments.

Keywords: Kinesiophobia; pain catastrophizing; chronic non-specific low back pain; disability

ÖZET Amaç: Bu çalışmanın amacı, kronik nonspesifik bel ağrılı hastalarda, kinezyofobi ve ağrıyı felaketleştirme davranışının bel ağrısı ilişkili engellilik üzerine etkisini araştırmaktır. **Gereç ve Yöntemler:** Üç aşamalı hasta alımı ile toplamda 54 hastanın verilerinin kaydedildiği prospektif ve kesitsel olarak tasarlanan bu çalışmada; sosyodemografik ve antropometrik verilerle birlikte, kinezyofobi (Tampa Kinezyofobi Ölçeği ile), katastrofi (Ağrıyı Felaketleştirme Ölçeği ile) ve bel ağrısı ilişkili engellilik düzeyine (Oswestry Engellilik İndeksi ile) ait veriler analiz edilmiştir. İstatistiksel analiz yoluyla; sürekli değişkenler, ortalama değer±standart sapma ve ortanca değer (minimum-maksimum) ile kategorik değişkenler ise sayı ve yüzde belirtecek şekilde ifade edilmiştir. Değişkenlerin korelasyonunu değerlendirmek amacıyla, Pearson ve Spearman korelasyon katsayısı kullanılmıştır. Korelasyon katsayısı 0,00-0,30 ise ihmal edilebilir, 0,30-0,50 ise düşük, 0,50-0,70 ise orta, 0,70-0,90 ise yüksek, 0,90-1,00 ise çok yüksek olarak kabul edilmiştir. **Bulgular:** Çalışmamızda; kinezyofobi ve katastrofi ile bel ağrısı ilişkili engellilik düzeyi arasında orta derecede pozitif korelasyon saptanmıştır. Bel ağrısı ilişkili engellilik düzeyi ile eğitim ve gelir düzeyi arasında düşük derecede negatif korelasyon saptanmıştır. **Sonuç:** Kinezyofobi ve ağrıyı felaketleştirme davranışı gibi psikososyal patolojiler, bel ağrısı ilişkili engelliliği olumsuz anlamda etkileyebilir. Tedavide, patoanatomik/biyomedikal yaklaşım yanında, psikososyal temelli bir değerlendirmenin yapılması, psikososyal patoloji saptanması durumunda ağrı eğitimi, kognitif davranışsal tedavi gibi tedavilerin mevcut tedaviye eklenmesi esastır.

Anahtar Kelimeler: Kinezyofobi; katastrofi; kronik nonspesifik bel ağrısı; engellilik

Low back pain leads the list of problems sourced in the musculoskeletal system.[1] After the acute low back pain period, most patients improve, with 50-70% experiencing repeated low back pain within the following year and 10% becoming chronic.[2] Chronic low back pain is one of the main causes of disability in the world in general, creates a significant portion of social health expenditure and is a multifaceted, complex and significant health problem.[3] When the cause of low back pain is investigated, vertebral column instability, root nerve compression and spinal stenosis can only be identified in 15% of people. Up to 80-90% of people cannot provide clear anamnesis about the quality of their pain in order for health professionals to identify the pathoanatomic situation causing pain. In this situation, the non-specific low back pain concept emerges.[4] Chronic non-specific low back pain (NSLBP) is a multifactorial clinical status with complicated levels of interrelationships. Among these factors are physical factors (e.g., bad posture and unsuitable movement patterns), cognitive factors (e.g., hopelessness, catastrophizing, hyper-vigilance, maladaptive coping behavior, weak self-efficacy), psychological factors (e.g., fear of movement, anxiety, depression), lifestyle factors (e.g., sedentary lifestyle, sleep problems, chronic stress), neurophysiological factors (e.g., peripheral and central nervous system sensitization) and social factors (e.g., socioeconomic status, family, work, culture).[5] While medical treatment, manual therapy, therapeutic exercises, relaxation exercises, and cognitive behavioral therapy may reduce disability related to low back pain, it is better understood that chronic non-specific low back pain is a multifactorial disease considering that none of these treatments targeting increased quality of life are superior to each other alone.[6]

MATERIAL AND METHODS

We performed 3-stage patient recruitment by 2 physiatrists between 25/06/2020 and 10/09/2020. In the first stage, patients compatible with the definition of chronic non-specific low back pain were determined. In the second stage, the study was explained in detail to the identified patients and volunteer patients were noted. In the third stage, volunteer patients were assessed again with the inclusion and exclusion criteria for the study (Table 1). Finally, patients suitable for our study completed the adult informed consent form for non-interventional clinical research.

TABLE 1: Inclusion and exclusion criteria for the study.
Inclusion criteria
• 20-65 years
• Independent mobilization
• Speaks Turkish, ability to complete the surveys independently
• Unexplained low back pain with no other organic cause between L1 and gluteal curve lasting longer than 3 months
• Verbal declaration of functional limitation related to low back pain during the diagnosis stage
• Severity of low back pain in the last week of 1 to 5 according to the Numeric Rating Scale (NRS)
• Identification of reduction in pain with removal of mechanical stress from the relevant segmen
Exclusion criteria
• Limitation of flexion or extension in the lumbar region
• Radicular pain present
• Presence of red flag criteria related to low back pain
• Surgical history for the lumbar region
• Interventional treatment for the lumbar region in the last 3 months (like epidural steroid injection, medial branch block)
• Presence of rheumatic, inflammatory disease and spine-related avascular necrosis (like spondyloarthropathies, rheumatoid arthritis, Scheuermann kyphosis)
• Presence of progressive neurological diseases (like Parkinson disease, multiple sclerosis, motor neuron disease)
• Presence of clear scoliosis which may be listed as the main cause of low back pain on examination (with Adam's forward bend test)
• History of malignancy
• Pregnancy
• Presence of alcohol use, drug or substance addiction (pregabalin, gabapentin, etc.), dementia, cognitive function disorder preventing normal functions of the central and peripheral nervous system

In our study, a sociodemographic form inquiring patient age, sex, marital status, place of residence, lifestyle in place of residence (alone, with partner, with partner and child(ren)), educational level, employment and income levels was filled out by the . participants. Additionally; smoking habits, body mass index (BMI) and severity of low back pain in the last 1 week (numeric rating scale (NRS)) were recorded. Apart from these data, we also used the following forms with Turkish validity and reliability studies; the Tampa Kinesiophobia Scale (TKS) to assess fear of movement; the Pain Catastrophizing Scale (PCS) to assess catastrophizing behavior related to pain; and the Oswestry Disability Index (ODI) to assess disability related to low back pain.[7-9] Our study, which included one responsible and one assisting researcher, was planned so that different clinicians diagnosed chronic non-specific low back pain and ensured completion of the sociodemographic form, TKS, PCS and ODI.

Statistical analysis was performed using the IBM SPSS version 22 package program. The results for continuous variables are given as mean±standard deviation (SD) and median (minimum-maximum). For categorical variables, results are presented as n (%). Normality of distribution for continuous variables was evaluated using the Kolmogorov-Smirnov test. According to the normality of the distribution, either Pearson's or Spearman's correlation coefficient was used to evaluate the correlation between measurements. Size of correlation was evaluated with the correlation coefficient (0.00-0.30 is negligible, 0.30-0.50 is low, 0.50-0.70 is moderate, 0.70-0.90 is high, 0.90-1.00 is very high). A p value of <0.05 was considered statistically significant.

Our research was performed in our hospital's Physical Medicine and Rehabilitation Clinic. Our study was designed with prospective, cross-sectional features. The protocol for our study was completed in accordance with related legislation, Erzincan Binali Yıldırım University non-interventional clinical research ethical directives (ethics committee meeting date: 22/06/2020 and ethics committee approval no: 33216249-50.01.02-E.25444 06/30), current guidelines, current Helsinki Declaration and good clinical practices principles.

RESULTS

Flow chart of our 3-stage patient enrollment study, detailed information related to categoric data and the mean and median values for the TKS used to assess kinesiophobia, the PCS used to assess catastrophizing (scores for helplessness, magnification and rumination subcomponents and total scores) and ODI score variables used to assess disability related to low back pain are stated below below (Figure 1, Table 2, Table 3).

In addition to survey data related to kinesiophobia, pain catastrophizing behavior and disability related to low back pain, our study assessed correlations with age intervals, educational level, income level and pain severity. Accordingly, kinesiophobia had moderate and positive correlation with pain catastrophizing behavior (including helplessness, magnification and rumination subcomponents) (rho:0.61, p<0.001), disability level related to low back pain (rho:0.52, p<0.001) and pain severity (rho:0.67, p<0.001). The feeling of helplessness was identified to have high-degree positive correlation with magnification (rho:0.84, p<0.001), rumination (rho:0.80, p<0.001), and total pain catastrophizing behavior (rho: 0.95, p<0.001) and moderate-degree positive correlation with pain severity (rho:0.54, p<0.001) and disability level related to low back pain (rho:0.60, p<0.001). Magnification was identified to have high-degree of positive correlation with rumination (rho:0.80, p<0.001) and total pain catastrophizing behavior (rho:0.92, p<0.001) and moderate-degree positive correlation with pain severity (rho:0.61, p<0.001) and disability level related to low back pain (rho:0.59, p<0.001). Rumination was identified to have high-degree positive correlation with total pain catastrophizing behavior (rho:0.92, p<0.001) and moderate positive correlation with pain severity (rho:0.54, p<0.001) and disability level related to low back pain (rho:0.56, p<0.001). Pain catastrophizing behavior was identified to have moderate-degree positive correlation identified with pain severity (rho:0.54, p<0.001) and disability level related to pain (rho:0.56, p<0.001). Disability level related to low back pain had low-degree negative correlation with educational level (rho:0.34, p:0.013)
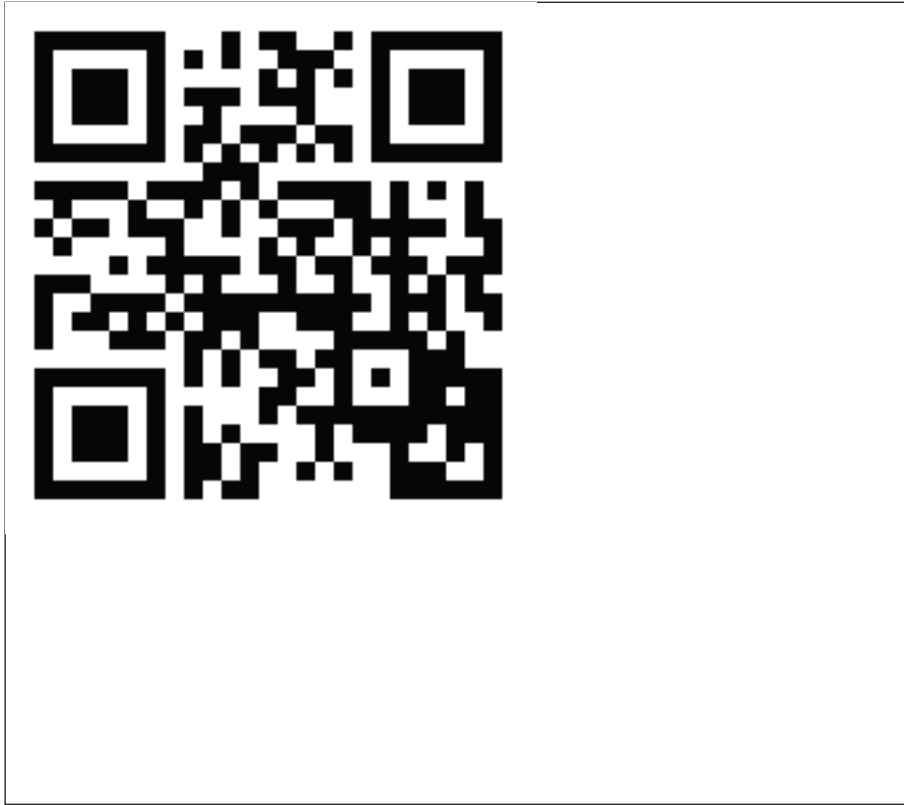
FIGURE 1: Flow of participants.

and income level (rho:0.37, p:0.005) and low-degree positive correlation with pain severity (rho:0.37, p:0.006). The correlation coefficients expressing the correlations between variables (rho) and detailed data related to statistical significance (p) are given below (Table 4).

DISCUSSION

Our study aimed not just to assess patients with chronic non-specific low back pain with the pathoanatomic/biomedical approach but also to attract attention to the need for an approach including psychological factors like kinesiophobia and catastrophizing, and lifestyle-related factors.

In our study, in chronic non-specific low back pain patients, kinesiophobia was found to have moderate relationships with pain catastrophizing behavior (including helplessness, magnification and rumination subcomponents), disability related to low back pain and initial pain levels. However, catastrophiz-

ing was found to have moderate relationships with initial pain levels and low back pain disability levels and mild relationship with low income level.

Limitations of our study may be listed as the small number of patients, not questioning medication use not investigating probable employment details that may affect low back pain-related disability levels and that low-back pain-related sexual problems within the scope of the ODI are probably less suggestive than reality due to sociocultural structure.

In the literature, there are many studies researching the effects of the pathoanatomic/biomedical approach in patients with low back pain. In spite of this, there are relatively fewer studies researching the effects of psychological disorders like kinesiophobia and pain catastrophizing on outcomes related to low back pain (e.g., quality of life, ability to work, disability). However, permanent and recurrent low back pain is not just an unavoidable biological process but is also a personal experience, which is

TABLE 2: Sociodemographic and clinical features of patients participating in the study.

		n	%
Age	20-30	12	22.2
	31-40	11	20.4
	41-50	16	29.6
	51-60	9	16.7
	61-65	6	11.1
Sex	Female	25	46.3
	Male	29	53.7
Type of home	Apartment	41	75.9
	Detached house	13	24.1
Marital status	Single	11	20.4
	Married	43	79.6
Living status	Alone	11	20.4
	With partner	9	16.7
	With partner + child(ren)	34	63.0
Educational level	Illiterate	2	3.7
	Elementary school	8	14.8
	Middle school	8	14.8
	High school	10	18.5
	University	26	48.1
Occupation	Unemployed	20	37.0
	Retired	11	20.4
	Desk job	12	22.2
	Physical labor	11	20.4
Income level	No income	7	13.0
	Below minimum wage	11	20.4
	Minimum wage	12	22.2
	2 times minimum wage	16	29.6
	3 times minimum wage	8	14.8
Smoking habit	None	39	72.2
	Quit smoking	15	27.8
Body Mass Index	Normal	29	53.7
	Overweight	25	46.3
Pain severity (NRS)	1	2	3.7
	2	22	40.7
	3	25	46.3
	4	5	9.3
Comorbidity	None	46	85.2
	Present	8	14.9

this, health professionals insist on using only the pathoanatomic/biomedical approach for NSLBP which causes the disease to become chronic, leads to overdiagnosis/overmedicalization and psychological injury linked to the continuous place of the disease in the patient's mind.[13-15] Brown et al. presented an interesting alternative prioritizing a constructive social diagnosis contrary to the classic pathoanatomic/biomedical approach and stated the keys to social diagnosis according to the approach were as follows;

1. Social diagnosis moves beyond individual-level explanations for health outcomes

2. Social diagnosis recognizes commonalities in the group experience

3. Social diagnosis moves beyond a diagnosis that is limited to treating or identifying symptoms and toward identifying more macro-structural roots. From here, it prescribes identifying and treating the fundamental causes of the problem, as opposed to just the proximal symptoms

4. Social diagnosis relies on scientific evidence but recognizes that useful science might not always come from mainstream sources, particularly when it involves lay people

5. Social diagnosis is attentive to changes across both the short and long-term. It moves beyond a cross-sectional approach to diagnosis, and instead prefers a multi-temporal approach to diagnosis, one that changes over time.[16]

A multicenter, cross-sectional study assessing 64 health employees with exposure to overuse loading on the low back region due to manual handling of patients researched kinesiophobia and pain catastro-

generally accepted as being connected to the social context, and cultural beliefs and implementations related to health.[10] More than 90% of patients with low back pain cannot have a structural cause identified and the definition NSLBP emerges. This biomedical-based definition leads to patients being inadequate in making sense of their disease, while health professionals are unsuccessful in predicting prognosis for patients and in treating their patients.[11,12] In spite of all

TABLE 3: Data for disability survey results related to kinesiophobia, catastrophizing and low back pain.

	Mean±SD	Median (Minimum-Maximum)
TKS	33.0±5.0	34.0 (20.0-44.0)
PCS (Helplessness)	9.3±5.5	9.0 (0.0-24.0)
PCS (Magnification)	5.2±3.0	5.0 (0.0-12.0)
PCS (Rumination)	5.7±4.7	5.5 (0.0-16.0)
PCS (Total)	20.0±12.0	21.0 (1.0-52.0)
ODI	27.1±14.4	26.0 (0.0-68.0)

SD: Standard deviation; TKS: Tampa Kinesiophobia Scale; PCS: Pain Catastrophizing Scale; ODI: Oswestry Disability Index.

	PCS (Helplessness)	PCS (Magnification)	PCS (Rumination)	PCS (Total)	ODI	Age	Educational Level	Income Level	Pain severity (NRS)
TABLE 4: Correlation data between kinesiophobia, catastrophizing, disability related to low back pain, age, educational level, income level and pain severity.									
TKS	0.60* (<0.001)	0.58 (<0.001)	0.58 (<0.001)	0.61 (<0.001)	0.52 (<0.001)	0.03 (0.816)	-0.17 (0.227)	-0.08 (0.592)	0.67 (<0.001)
PCS (Helplessness)	-	0.84 (<0.001)	0.80 (<0.001)	0.95 (<0.001)	0.60 (<0.001)	-0.19 (0.170)	-0.06 (0.687)	-0.24 (0.081)	0.54 (<0.001)
PCS (Magnification)	-	-	0.80 (<0.001)	0.92 (<0.001)	0.59 (<0.001)	-0.18 (0.188)	-0.01 (0.956)	-0.28 (0.044)	0.61 (<0.001)
PCS (Rumination)	-	-	-	0.92 (<0.001)	0.56 (<0.001)	-0.151 (0.276)	-0.06 (0.644)	-0.29 (0.031)	0.54 (<0.001)
PCS (Total)	-	-	-	-	0.56 (<0.001)	-0.15 (0.276)	-0.06 (0.644)	-0.29 (0.031)	0.54 (<0.001)
ODI	-	-	-	-	-	0.09 (0.528)	-0.34 (0.013)	-0.37 (0.005)	0.37 (0.006)

TKS: Tampa Kinesiophobia Scale; PCS: Pain Catastrophizing Scale; ODI: Oswestry Disability Index; NRS: Numeric Rating Scale
*results were presented with one under the other as correlation coefficient: rho and significance: (p)

phizing behavior and their effects on disability related to low back pain. In conclusion, they identified that the majority of health employees with load exposure due to overuse had kinesiophobia and pain catastrophizing behavior and additionally, these negative psychological factors had moderate level positive correlation with disability related to low back pain.[17] Different to this study in a narrow patient population, in our study we assessed a broader patient population without regard to any population, and in parallel with this study, identified that kinesiophobia and catastrophic thoughts affected disability related to low back pain at moderate levels.

When prognostic markers associated with poor treatment outcomes were researched for patients attending primary care with non-specific low back pain, another study of 115 patients assessed sociodemographic and clinical data, psychosocial factors, pain severity, disability and quality of life of patients initially and in the 2nd and 6th months. The study results found poor clinical outcomes were associated with longer duration of low back pain episode and the presence of maladaptive psychosocial factors. Six months after beginning primary care treatment due to NSLBP, nearly half of the participants were identified to have poor outcomes. Additionally, if any recovery was identified in patients, this was within the

first 8 weeks and there was no significant change between 2 and 6 months. It was reported that unemployment was responsible for poor outcomes.[18] In this study, nearly half of the patients had poor clinical outcomes after 6 months of primary care treatment which may be due to health professionals' mainly dealing with non-specific low back pain only with the pathoanatomic/biomedical approach. In our study, we assessed income level as a representation of unemployment and identified a negative correlation between income level with pain catastrophizing behavior (only magnification and rumination subcomponents) and disability related to low back pain. In parallel with this study, we believe that treatment outcomes will be negative in situations without identification of maladaptive psychosocial behaviors like kinesiophobia and pain catastrophizing and no determination of appropriate treatment strategies in patients with chronic non-specific low back pain.

A multicenter study retrospectively assessing patient information for 310 Italian patients with chronic low back pain researched the correlation of poor pain-related self-efficacy with disability, pain level, and some demographic and clinical information. Assessment parameters included the Pain Self Efficacy Questionnaire (PSEQ), Roland Morris Disability Questionnaire (RMDQ), and Numeric Rating Scale

(NRS). The cut-off value for poor self-efficacy was 40/60 on the PSEQ score and accordingly 199 patients were identified to have poor self-efficacy. In conclusion, in chronic low back pain patients, female sex and medication use were associated with poor self-efficacy; low educational level was associated with perceived pain and disability; and advanced age and smoking habit were associated with disability and pain severity. They included the view that knowing this clinical and sociodemographic data was essential for targeted treatment of patients with chronic low back pain.[19] In our study, gratifyingly none of our patients smoked. One of the limitations of our study is that what we described as medication use was not interrogated. As a result, we can make no interpretation of the effects of these two factors on kinesiophobia, catastrophizing and disability related to low back pain. However, in our study we did not identify a significant correlation between age with kinesiophobia, catastrophizing and disability related to low back pain. This situation may be associated with the low-degree positive correlation of pain severity when assessed in terms of disability, and that some patients had to work to advanced ages due to socioeconomic differences in our employed patient population. Though it is not correct to make a one-to-one comparison, in terms of providing an idea an ethnographic study in Nepal could not identify a significant correlation between pain severity and disability due to low back pain as the very low socioeconomic status of people living in rural areas meant that patients had to continue working regardless of how great their pain severity.[20] Again, a different study in Nepal revealed the reality that 80% of patients with chronic pain had to continue working.[21]

Clinical practice guidelines for low back pain recommend reassurance, training and self-management by active participation of patients in primary care treatment. For acute low back pain, surface heat and manual therapy is recommended. For chronic low back pain, psychological treatments and exercise are recommended.[22-24]

Patient education (biomedical training and pain physiology training) may be a route to provide information and recommendations aiming at changing patients' awareness levels about chronic situations in a positive way to reduce fear due to perceptions of serious results that may be caused by low back pain and to ensure return to normal daily activities.[25]

Cognitive functional therapy (CFT) is a new patient-focused behavioral treatment dealing with chronic NSLBP from many aspects. This approach focuses on changing patient beliefs, patients confronting their fears, educating them about pain mechanisms, increasing patient awareness about control of their bodies during functional duties causing pain, reducing excessive muscle activity in the trunk and changing behavior related to movements and stances causing pain.[26]

A randomized controlled study compared the effects on pain and functionality of short duration neurophysiological training and sensorimotor retraining with conventional physiotherapy for chronic non-specific low back pain patients. Twenty-eight patients were assessed at basal time and 12 weeks later. Patients with RMDQ of 5 and above and with moderate or high risk of poor treatment response (with the Keele Start Back Tool) were randomized into multimodal treatment (MMT) including neurophysiological education and sensorimotor retraining (n:14) and a conventional physiotherapy program (n:14). Patients received both treatments in 16 sessions administered over 8-12 weeks in total. The two groups were given a 10-30-minute home exercise program to perform 5 times per week. After treatment, primary and secondary outcome analysis used the NRS and RMDQ. In conclusion, while there was no significant difference between the two treatments in terms of disability in this short time duration, there was a significant difference in favor of the MMT group for pain outcome scores.[27]

Another randomized controlled study with 3-year follow-up duration and participation of 121 chronic NSLBP patients compared CFT with the combination of manual therapy and exercise therapy. Primary outcomes were disability level (ODI) and pain severity (NRS), while secondary outcomes were anxiety and depression (Hopkins Symptoms Checklist) and fear associated with pain levels (Fear-Avoidance Belief Questionnaire). According to the study results, CFT

was found to be more effective in terms of reducing depression, anxiety and fear related to pain, while there was no significant difference identified between the two groups in terms of reduced pain levels. Again, though CFT did not positively affect pain severity, it was emphasized to possibly be effective in reducing disability associated with low back pain.[28]

Based on both short-term and long-term outcomes in these two studies above, we believe that if necessary psychological assessment should be performed, apart from the pathoanatomic/biomedical approach for patients with chronic non-specific low back pain, and psychological treatments effective on pain beliefs, functional restoration and lifestyle factors like neurophysiological education, sensorimotor retraining and cognitive functional therapy should definitely be added to treatment in the name of reducing pain levels and preventing disability related to low back pain.

CONCLUSION

Based on our study findings and the current literature, we emphasize that it is definitely necessary to identify maladaptive psychological factors led by kinesiophobia and catastrophic thoughts and including negative disease perception, depression, poor self-efficacy and fear avoidance among patients with chronic non-specific low back pain. In addition to classic pathoanatomic/biomedical approach treatments, we think it is necessary for health professionals dealing with spine health to adopt the social diagnosis approach brought to the agenda by Brown et al. In situations with identification of maladaptive psychological factors, we believe there is a need for approaches like pain education, cognitive functional therapy (CFT) or multimodal treatments including both psychological and physical treatment methods to prevent non-specific low back pain becoming chronic and resulting in disability. From the view of possible negative effects of NSLBP on disability, it is clear there is a need for more assessment of psychosocial status in studies with higher patient participation.

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