

IMPACT OF KINESIOPHOBIA ON QUALITY OF LIFE IN SUBJECTS WITH LOW BACK PAIN: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Studies has demonstrated the development of Kinesiophobia in Low Back Pain (LBP) and identified as one of the risk factor for chronicity in LBP. In addition to deconditioning effect, Kinesiophobia also install functional disability and does that affect quality of life? Literatures had exposed the association of Kinesiophobia in chronic and acute low back pain separately but paucity in estimating their quality of life thus this study aims to explore the impact of Kinesiophobia on the quality of life in LBP.

Materials and Methods: One hundred and twenty study participants were recruited by convenient sampling method between 18 – 60 years of age. Data were collected by using Tampa scale of Kinesiophobia, Numerical Pain Rating Scale, SF-36 Health Status Questionnaire and Modified Oswestry Disability Questionnaire for LBP. Secured scores were analysed in SPSS software to identify the association between Kinesiophobia and other functional scales.

Results: Mean age of the study participant was 39.79±11.22 years. Prevalence rate of high degree of Kinesiophobia was found as to be 58.33% (n=70). As the intensity of pain increases in LBP, the development of Kinesiophobia also increased and its association exhibited as weak positive linear correlation (r=0.256, p=0.032). Development of Kinesiophobia has demonstrated increased functional disability where correlation between Kinesiophobia and Oswestry disability shows moderate positive correlation (r = 0.495, p=0.000) simultaneously correlation between Kinesiophobia and SF-36 shows moderate negative correlation (r = - 0.420, p=0.000) indicating decreased Quality of Life.

Conclusions: It has been found that there is a direct relationship between the pain and the development of Kinesiophobia in LBP which in turn increase in the development of functional disability thus marking decreased QOL.

KEY WORDS: Low Back Pain, Kinesiophobia, Quality of life.

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INTRODUCTION

Low Back Pain (LBP) is one of the most common complaints of all the musculoskeletal disorders that most people experience at some point of

time in life [1]. LBP is defined as pain in the area on the posterior aspect of the body from the lower margin of the twelfth ribs to the lower gluteal folds with or without pain referred into

one or both lower limbs. It is the most second common reason for visits to physicians [2]. Prevalence and incidence of LBP is increasing steadily in all industrialised countries and in Indian population it has been found to range from 6.2% to 92% that increase with age leading to activity limitation, absenteeism from work and enormous socioeconomic burden [3,4].

Symptoms of LBP may be experienced as dull aching to burning, stabbing and sharp shooting, localised to vague presentation with intensity of pain ranging from mild to severe. According to fear avoidance model it has been postulated that in acute stage of pain, fear of movement or "Kinesiophobia" is adopted which leads to the systematic avoidance of physical activity thus in long term result in physical deconditioning. Vlaeyen et al in 1995[5] describes Kinesiophobia with cognitive behavioural perspective that persons who catastrophically misinterpret innocuous pain are likely to become fearful of pain that results in at least avoidance behaviours, avoidance of movement particularly physical activity, increased bodily awareness and pain hypervigilance that might exacerbate the painful experience [5-7].

Enormous literature has demonstrated development of Kinesiophobia among LBP patients. In 1990 Kori et al defined Kinesiophobia as an "unreasonable and irrational fear of pain and painful re-injury upon physical movement" [11]. It is regarded as a salient predictor of pain disability in chronic pain population and has been identified as one of the risk factors for chronicity in LBP. Kinesiophobia can be assessed psychometrically by using Tampa Scale of Kinesiophobia (TSK) and/or Fear-Avoidance Beliefs Questionnaire (FABQ) [7-11]. Both instruments yielded high values for internal consistency, reproducibility and shows good construct validity. However, TSK was shown to be more responsive than the FABQ in all internal and external responsiveness analyses also in identifying fear avoidance changes over time [10]. TSK consist of 17 components which measures degree of Kinesiophobia subjectively. Originally this scale was constructed to differentiate between non-excessive fear and phobia among chronic musculoskeletal pain [8, 12].

Avoidance behaviour in Kinesiophobia is not only

restricting in deconditioning effect on musculoskeletal system but also installing functional disability, absenteeism from work, limitation for social and leisure activities which in turn exhibit the development of generalised withdrawal and a depressive syndrome that likely to affect the quality of life. Global burden of disease 2010 study reported, LBP causes more global disability and ranked sixth in terms of overall burden [13]. It also affects basic self-care activities and eventually has a profound impact on quality of life. Various cross-sectional and prospective studies have had demonstrated that health related quality of life (HRQOL) is affected in patients with LBP and, therefore, HRQOL should be considered as an important outcome in clinical trials investigating LBP [14,15] since the long term goal of the orthopaedic management focus on improving Quality of Life(QOL).

Functional disability which is exhibited in LBP can be assessed by Modified Oswestry LBP Disability Questionnaire (MODQ) since it measures a patient's perceived functional disability and it is designed to give information about how a patient's back pain affects his or her ability to manage in everyday life [16, 17]. Similarly Short Form Health Survey (SF-36), developed by Ware and Sherbourne in 1992, Questionnaire helps in measuring the areas and amount of quality of life that affected, it consists of eight scaled scores, which are the weighted sums of the questions in their section [18]. Its reliable and valid measure for clinical and general populations with an estimated interclass correlation coefficient of 0.85 [18, 19].

A wealth of literature which had exposed association of Kinesiophobia in chronic and acute low back pain separately but lacking in estimating their quality of life. Hence this study aims to explore the impact of Kinesiophobia on the quality of life in patients with low back pain with the objectives to find out the occurrence of Kinesiophobia in acute, sub-acute and chronic LBP patients and its association between pain, functional disability and Quality of Life.

MATERIALS AND METHODS

This is a cross sectional study, carried out between January 2016 to June 2016 after obtaining institutional ethical committee approval.

One hundred and twenty study participants were recruited by convenient sampling method from Mumbai and Navi Mumbai. Clinically subjects who were diagnosed as Low back pain of both sexes aged between 18–60 years were included in the study. Based on duration of the pain they were grouped into acute (up to 6 weeks), sub-acute (6 weeks-12 weeks) and chronic (more than 12 weeks). Subjects with neurological diseases (CVA, Cerebral palsy, Parkinson's disease), any type of recent fractures, chronic cancer pain, LBP with non-musculoskeletal causes as well as subjects who are recuperating in post-operative process of any nature were carefully excluded. A self-made questionnaire was developed to record basic demographic details of the study participants. The purpose of the study was explained in the language they understand and informed consent was obtained for those who fulfilled inclusion and exclusion criteria.

Tampa scale of Kinesiophobia (TSK) was used to measure fear of movement/ Kinesiophobia [8]. It consists of 17 questions and each addressing intensity of pain and symptoms. The responses were measured in 4 point Likert scale where "totally disagree" is equivalent to one point, two for "partially disagree", "partially agree" and "totally agree" shares three and four points respectively. To obtain the final score it is necessary to invert scores of questions 4, 8, 12 and 16. The possibility score in the scale may range from minimum of 17 to utmost 68 points, being that the higher the score indicates (À37) higher the level of Kinesiophobia. [5, 20]. The level of pain intensity among the participants was rated in Numerical Pain Rating scale (NPRS). It is an 11 point scale that demonstrate good psychometric properties. Participants were asked to indicate the intensity of current, best, and worst pain levels over the past 24 hours on a scale of 0 (no pain) to 10 (worst pain imaginable). Average of three pain level was considered where score of zero indicates no pain, 1-3 mild pain, 4-6 moderate pain and 7-10 as severe pain. [21, 22].

Functional disability in LBP was assessed by Modified Oswestry Disability Questionnaire. The responses were measured from zero to five points for all ten activities described in the scale, the possible highest score being 50, scores

which are weighted by the sums of all the question and the percentage was obtained. Scores between 0-20% denote as minimal disability, 21-40% indicate moderate disability, 41-60% for severe disability, 61-80% suggest that the subject is crippled whereas scores between 81% to 100% meant either the subject is bed-bound or exaggerating his symptoms [16,17].

Quality of life among the participants were measured by using SF-36 Health Status Questionnaire. It is a 36-item questionnaire which measures across eight domains that includes vitality, physical functioning, bodily pain, general health perceptions, physical role functioning, emotional role functioning, social role functioning and mental health. For each of the eight domains that an aggregate percentage score is produced. The percentage scores range from 0% (lowest or worst possible level of functioning) to 100% (highest or best possible level of functioning) [23].

Modified Oswestry Disability Questionnaire, Tampa Scale of Kinesiophobia and SF-36 Health Status Questionnaire were applied by interview based method. Secured scores were analysed in SPSS Statistical Software version 17 (SPSS Inc., Chicago, IL, USA) where descriptive statistics was applied for an overall description of the study population. To measure the association between Pain intensity, functional disability and Quality of Life with Kinesiophobia, Pearson's correlation coefficient was applied since the continuous variables demonstrated normal distribution and the statistical significance was set at 5%.

RESULTS

One hundred and twenty completed questionnaire were collected and tabulated for analysis. Mean age of the study participant was 39.79±11.22 years. In the sample space of 120, male participants were 49% and 51% were females. Prevalence rate of high degree of Kinesiophobia found as 58.33% (n=70) and 41.67% had demonstrated low level of Kinesiophobia. 53% female subjects demonstrated high degree of Kinesiophobia and its distribution according to age group shown in Figure.1.

Table 1: Duration of Low Back Pain and Its functional Scale Mean Score.

Subjects without Kinesiophobia					Duration of LBP	Subjects with Kinesiophobia				
MODQ %	SF36	TSK	NPRS	n		n	NPRS	TSK	SF36	MODQ %
19.22± 2.61	55.86±7.69	32.17± 2.55	4.70±1.46	23	Acute	17	7.29±0.99	43.18±3.81	39.37±4.39	42.94±2.14
36.38± 8.43	48.01±4.08	31.62± 2.75	6.33±1.32	21	Sub-acute	19	7.63±1.21	45.74±5.37	39.55±9.25	58.11±14.31
16.66± 14.84	28.91±26.82	17.27± 16.89	3.45±2.48	6	Chronic	34	6.32±1.32	40.68±2.81	43.2±6.68	30.53±7.32

MODQ, Modified Oswestry Disability Questionnaire;SF-36, Short Form Health Survey;TSK, Tempa Scale of Kinesiophobia;NRPS, Numerical Pain Rating Scale.

Distribution pattern of Kinesiophobia with respect to pain duration of LBP shown in Figure 2. However, among the subjects with high degree of Kinesiophobia, majority were seen in chronic LBP which accounted for 49% followed by sub-acute 27% and acute 24%. The mean score of pain intensity, TSK, SF36 and MODQ with respect to duration of LBP in shown in Table 1

Fig. 1: Distribution of Subjects According to Age Group.

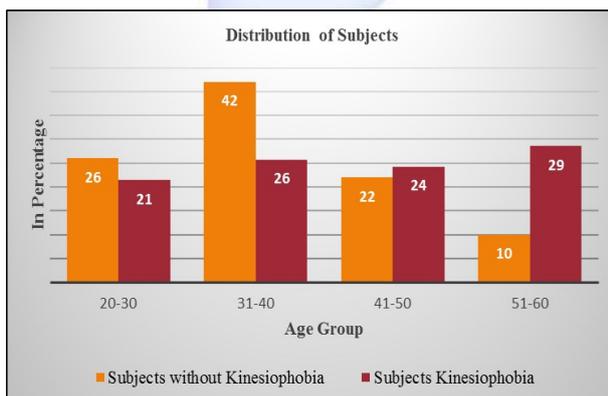
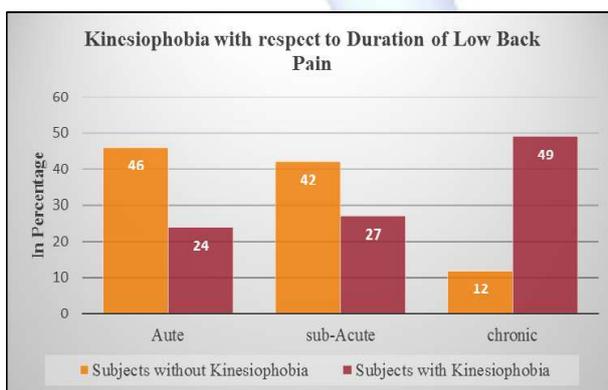


Fig. 2: Kinesiophobia with respect to Duration of Low Back Pain.



67% of subjects with Kinesiophobia demonstrated severe pain intensity whereas in subjects without Kinesiophobia, majority of 64% of them showed moderate intensity of pain and illustrated in Figure.3. It has been observed as the pain intensity increases in LBP the development of Kinesiophobia also increased and its association exhibited as weak positive linear corre-

lation ($r=0.256$, $p=0.032$), shown in Figure 4.

Fig. 3: Distribution of Pain Intensity in subjects with and without Kinesiophobia.

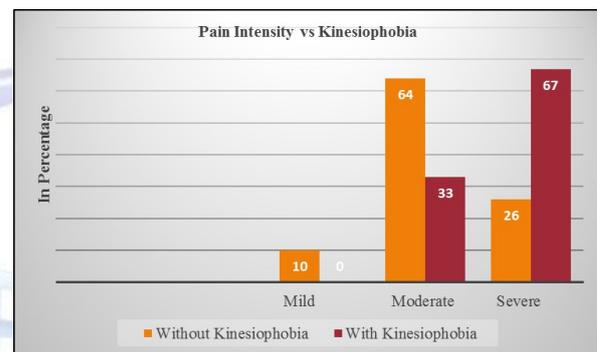


Fig. 4: Relationship of Pain Intensity and Kinesiophobia.

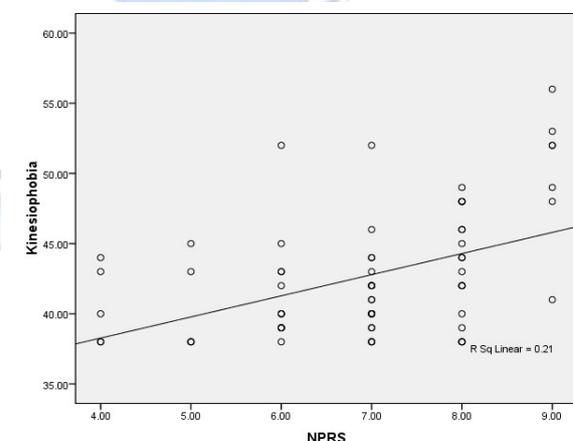
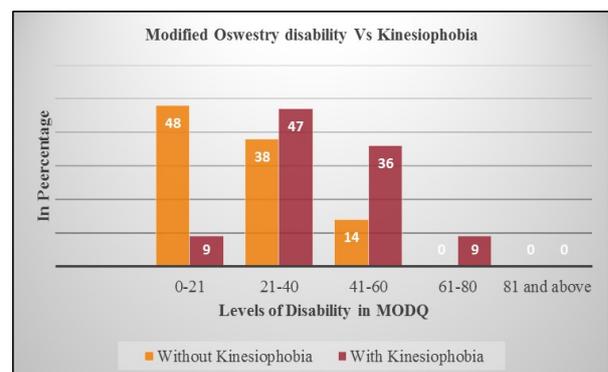


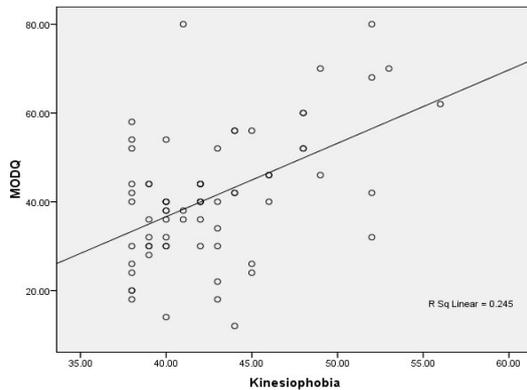
Fig. 5: Frequency Distribution of Levels of Disability in MODQ.



Mean scores of Modified Oswestry Disability Questionnaire in subjects with Kinesiophobia

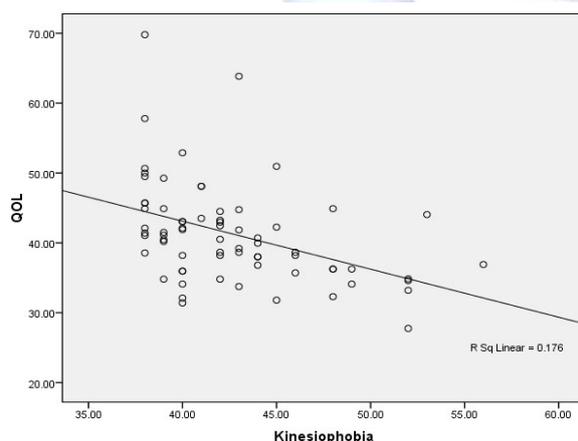
(41.03±14.68) was found to be more than in subjects without Kinesiophobia (25.52±11.24). Frequency of functional disability is shown in Figure 5. Correlation between Kinesiophobia and Oswestry disability shows moderate positive correlation ($r = 0.495$, $p=0.000$), shown in Figure 6.

Fig. 6: Relationship between Kinesiophobia and MODQ.



To measure the impact of Kinesiophobia on Quality of Life, mean score of SF-36 was compared between subjects with and without Kinesiophobia. It was found that the mean score of QOL in subjects with Kinesiophobia was lesser than those without, that includes 41.28±7.19 and 52.58±8.57 respectively. However, Correlation between Kinesiophobia and QOL shows moderate negative correlation ($r = -0.420$, $p=0.000$) that can be seen in Figure 7.

Fig. 7: Relationship between Kinesiophobia and Quality of Life.



DISCUSSION

This study explored the impact of Kinesiophobia on quality of life in subjects with low back pain and also explored its association with pain intensity as well as functional disability. There is high degree of Kinesiophobia found and its prevalence among female was found to be more.

Though the reason is unclear perhaps it could be owing to decreased bone mass, reduced muscle strength, sensitivity to pain and repeated exposure to ADL such as lifting, bending as compared to their male counterpart thus increasing risk.

Atalay et al (2001) stated as age increases there is a higher prevalence of Kinesiophobia, similarly subjects who exhibited high degree of Kinesiophobia, in this study, were in the age group of 50-60 years [24]. Despite prevalence of Kinesiophobia was evident in acute and sub-acute phase of LBP, majority of 49% were of in chronic phase and it was observed that as the duration of the LBP increases the prevalence rate of the Kinesiophobia also increased. This agrees with population based cohort study that carried out by H. Susan J. Picavet et al in 2002[25]. The prevalence of Kinesiophobia was found to be more in chronic cases because in the acute pain situation, avoidance of daily activities that increase pain is a spontaneous and adaptive reaction of the individual as described by Wall (1979) which usually allows the healing process to occur. Bortz et al in 1984 explained that in chronic pain patients, however, avoidance behaviour appears to persist beyond the expected healing time, and may subsequently lead to 'disuse' syndrome. The disuse syndrome is a detrimental condition, associated with physical deconditioning, in which performance of physical activities leads more easily to pain and physical discomfort which in turn makes avoidance more likely [26].

Nevertheless the prevalence rate of Kinesiophobia was higher among the chronic LBP but their mean score of intensity of pain was found lesser as when compared to sub-acute and acute LBP. Participants of sub-acute LBP had demonstrated greatest affection not only in pain intensity but also in TSK as well as in Modified MODQ. This observed difference amongst sub-acute LBP, need to explore in a large scale to understand its relationship and is out of scope for the discussion here. Is it a cognitive-behaviour influenced in development of higher rate of Kinesiophobia among chronic LBP? Explains cognitive-behavioural model, Vlaeyen et al in 1995 [5], which represents the mechanism how fear of movement/ (re)injury possibly contributes to

the maintenance of chronic pain disability in CLBP, starting with the injury occurring during the acute phase. The painful experiences, which are intensified during movement, will elicit catastrophizing cognitions in some individuals and more adaptive cognitions in others [5]. However weak positive linear association between pain intensity and Kinesiophobia ($r=0.256$) was ascertained and this result is in parallel with the results found in the literature.

As the intensity of pain increases the perception of the Kinesiophobia also increases, allowing restricted pattern of movement, and lead into development of functional disability. This study reveals higher disability rate among subjects with Kinesiophobia than in those without Kinesiophobia. Moderate positive correlation was found between TSK and MODQ ($r= 0.495$, $P=0.000$). Correlation coefficients between disability scores and measures of fear-avoidance beliefs in patients with acute LBP has been reported with similar magnitude($r=0.34$) by Thomas EN et al in 2010 [27] established their relationship between them and considered Kinesiophobia as a predictor in development of disability in LBP. Among the common everyday activities, the ones which are most affected by LBP are lifting, standing, sitting, travelling and employment or homemaking duties. Thus, marking disability in performing day-to-day activities and creating a negative impact on their QOL.

Concurrently subjects with Kinesiophobia also had demonstrated inverse relationship with QOL which was measured by SF-36 questionnaire. The most affected QOL domain found in this study was the physical domain with a mean score of 36.79, while the mean of mental domain was 46.75. In this study there was a moderate negative correlation established between Kinesiophobia and QOL ($R = -0.420$, $P=0.000$) signifying that the QOL decreased with increasing level of Kinesiophobia. Identically Filiz Altug et al [28] reported highly negative correlation between TSK and SF36 having major affection in physical domain amongst Chronic LBP. The fear of pain, driven by the anticipation of pain and not by the sensory experience of pain, has been suggested as a strong negative reinforcement for the persistence of avoidance behaviour leading to decreased physical activity and the

alleged functional disability thus advancing them into depression affecting QOL in low back pain subjects.

These beliefs about back pain, pain catastrophizing, anxiety, depression, disability, fear avoidance are all identified as important predictors of QOL in patients with LBP [29]. It is now widely recognized that pain has both sensory and cognitive dimensions. Fear of pain and pain avoidance behaviour are two important factors that should be integrated in the clinical assessment of low back pain. Aspects of cognitive treatment focussing on these attitudes and beliefs should be incorporated in the behavioural treatment of Low back pain. Thus, LBP patients in particular require an approach that address both physical (Biological) and psychosocial dimensions of their problem. This modern approach is termed as Biopsychosocial (BSP) approach. Rather than focussing on structural causes and cures, this new paradigm emphasize the goal of maintaining and restoring function [30]. Affection of cognitive behaviour in the occurrence of Kinesiophobia demands of multidisciplinary approach in the inceptive phase of LBP to decrease functional disability and enhancing QOL.

Limitation of this study includes relationship in the development of Kinesiophobia in subacute LBP was overlooked and mental component in QOL was not analysed with statistical application. In the future, study can also explore the benefit of biopsychological approach in acute LBP in improving QOL.

CONCLUSION

In this study the prevalence rate of Kinesiophobia was reported as highest among chronic LBP subjects. It has been observed that there is a direct relationship between pain and the development of Kinesiophobia in LBP which in turn increase in the development of functional disability thus marking decreased QOL among these populations.

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ABBREVIATIONS

LBP - Low Back Pain

TSK - Tampa Scale of Kinesiophobia

FABQ - Fear-Avoidance Beliefs Questionnaire

HRQOL - health related quality of life

QOL - Quality of Life.

MODQ - Modified Oswestry LBP Disability Questionnaire

SF-36 - Short Form Health Survey.

NPRS - Numerical Pain Rating scale.

Conflicts of interest: None

REFERENCES

- [1]. Woolf AD, Pfleger B. Burden of major musculoskeletal conditions. *Bulletin of the World Health Organization*. 2003;81(9):646-656.
- [2]. Hoy D, Bain C, Williams G, et al. A systematic review of the global prevalence of low back pain. *Arthritis & Rheumatism*. 2012;64(6):2028-2037.
- [3]. Hoy D, Brooks P, Blyth F, Buchbinder R. The Epidemiology of low back pain. *Best Practice & Research Clinical Rheumatology*. 2010;24(6):769-781.
- [4]. Bindra S, Sinha A.G.K, Benjamin A.I. Epidemiology of low back pain in Indian population: A review. *International Journal of Basic and Applied Medical Sciences*. 2015;5(1):166-179.
- [5]. Vlaeyen S, Kole-Snijders AM, Boeren RG, van Eek H. Fear of movement/ (re)injury in chronic low back pain and its relation to behavioural performance. *Pain*. 1995;62:363-72.
- [6]. Wong WS, Lam HM, Chen PP et al. The Fear-Avoidance Model of Chronic Pain: Assessing the Role of Neuroticism and Negative Affect in Pain Catastrophizing Using Structural Equation Modelling. *Int J Behav Med*. 2015 ;22(1):118-31.
- [7]. Waddell G, Newton M, Henderson I, Somerville D, Main CJ. A Fear-Avoidance Beliefs Questionnaire (FABQ) and the role of fear-avoidance beliefs in chronic low back pain and disability. *Pain*. 1993;52(2):157-68.
- [8]. Kori SH, Miller RP, Todd DD. Kinesiophobia: a new view of chronic pain behavior. *Pain Management*. 1990;3:35-43.
- [9]. Swinkels-Meewisse EJ, Swinkels RA, Verbeek AL, Vlaeyen JW, Oostendorp RA. Psychometric properties of the Tampa Scale for kinesiophobia and the fear-avoidance beliefs questionnaire in acute low back pain. *Man Ther*. 2003 ;8(1):29-36.
- [10]. de Souza FS, Marinho CS, Siqueira FB, Maher CG, Costa LO. Psychometric testing confirms that the Brazilian-Portuguese adaptations, the original versions of the Fear-Avoidance Beliefs Questionnaire, and the Tampa Scale of Kinesiophobia have similar measurement properties. *Spine (Phila Pa 1976)*. 2008;33(9):1028-33.
- [11]. Lundberg MKE, Styf J, Carlsson SG. A psychometric evaluation of the Swedish version of the Tampa Scale for Kinesiophobia (TSK) from a physiotherapeutic perspective. *Physiotherapy Theory and Practice*. 2009; 20(2):121-133.
- [12]. Salvetti M, Pimenta CA, Braga PE, Corrêa CF. Disability related to chronic low back pain: prevalence and associated factors. *Rev. esc. enferm. USP*. 2012 Oct;46(spe):16-23. Available from: <http://dx.doi.org/10.1590/S0080-62342012000700003>.
- [13]. Hoy D, March L, Brooks P, et al. The global burden of low back pain: estimates from the Global Burden of Disease 2010 study. *Ann Rheum Dis*. 2014;73(6):968-74. Epub 2014 Mar 24.
- [14]. Montazeri A, Mousavi SJ. Quality of Life and Low Back Pain. In *Handbook of disease burdens and quality of life measures*. 2010:3979-3994. New York, NY: Springer New York. doi:10.1007/978-0-387-78665-0_232
- [15]. Kotryna V, Kazys VA, Bronius Š. Health-related quality-of-life assessment in patients with low back pain using SF-36 questionnaire. *Medicina (Kaunas)*. 2007;43(8):607-13.
- [16]. Fritz JM, Irrgang JJ. A comparison of a modified Oswestry Low Back Pain Disability Questionnaire and the Quebec back pain disability scale. *Phys Ther*. 2001;81(2):776-88.
- [17]. Baradaran A, Ebrahimzadeh MH, Birjandinejad A, Kachooei AR. Cross-Cultural Adaptation, Validation, and Reliability Testing of the Modified Oswestry Disability Questionnaire in Persian Population with Low Back Pain. *Asian Spine J*. 2016;10(2):215-219.
- [18]. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care*. 1992;30(6):473-83.
- [19]. Laucis NC, Hays RD, Bhattacharyya T. Scoring the SF-36 in Orthopaedics: A Brief Guide. *J Bone Joint Surg Am*. 2015; 97(19): 1628-1634.
- [20]. Uluđ N, Yakut Y, Alemdarođlu Ý, Ýılmaz Ö. Comparison of pain, kinesiophobia and quality of life in patients with low back and neck pain. *J. Phys. Ther. Sci. J Phys Ther Sci*. 2016; 28(2): 665-670.
- [21]. Childs JD, Fritz JM, Flynn TW, Irrgang JJ, Johnson KK, Majkowski GR, et al. A Clinical Prediction Rule to Identify Patients with Low Back Pain Most Likely To Benefit from Spinal Manipulation: A Validation Study. *Ann Intern Med*. 2004;141:920-928.
- [22]. Boonstra AM, Stewart RE, Köke AJA, et al. Cut-Off Points for Mild, Moderate, and Severe Pain on the Numeric Rating Scale for Pain in Patients with Chronic Musculoskeletal Pain: Variability and Influence of Sex and Catastrophizing. *Frontiers in Psychology*. 2016;7:1466.
- [23]. How to score the SF-36. [Internet]. Available from: http://www.rand.org/health/surveys_tools/mos/36-item-short-form/scoring.html.

- [24]. Atalay A, Arslan S, Dinçer F. Psychosocial function, clinical status, and radiographic findings in a group of chronic low back pain patients. *Rheumatol Int.* 2001; 21(2): 62-65.
- [25]. Picavet HS, Vlaeyen JW, Schouten JS. Pain catastrophizing and kinesiophobia: predictors of chronic low back pain. *American Journal of Epidemiology* 2002; 156(11): 1028-34.
- [26]. Vlaeyena JWS, Linton SJ. Fear-avoidance and its consequences in chronic musculoskeletal pain: a state of the art. *Pain.* 2000; 85: 317-332.
- [27]. Thomas EN, Pers YM, Mercier G, et al. The importance of fear, beliefs, catastrophizing and kinesiophobia in chronic low back pain rehabilitation. *Ann Phys Rehabil Med.* 2010; 53: 3–14.
- [28]. Altuğ F, Ünal A, Kilavuz G, Kavlak E, Çitipli V, Cavlak U. Investigation of the relationship between kinesiophobia, physical activity level and quality of life in patients with chronic low back pain. *J Back Musculoskelet Rehabil.* 2016;29(3):527-31.
- [29]. Ogunlana MO, Odunaiya NA, Dairo MD, Ihekuna O. Predictors of Health-related Quality of Life in Patients with Non-specific Low Back Pain. *AJPARS* 2012; 4:15 – 23.
- [30]. Kevin A. Parish. A biopsychosocial approach to chronic low back pain and disability in a private chiropractic setting: a case study. *J Can Chiropr Assoc.* 2002; 46(2): 93–100.

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