

Effects Of Short Foot Exercises On Kinesiophobia In Patients With Functional Ankle Instability Using CAIT

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ABSTRACT

Short-Foot Exercise (SFE) Is A Widely Used Balance Training Intervention That Has Been Developed Recently To Improve Ankle Proprioception And To Strengthen The Intrinsic Foot Muscles (IFM) To Elevate And Support The Medial Longitudinal Arch (MLA) Of The Foot And Improve Dynamic Standing Balance SFE Is Performed By Attempting To Pull The Head Of The First Metatarsal Toward The Calcaneus, Without Curling The Toes. Kinesiophobia, Also Called "Fear Of Movement Or Activity," Is Defined As An Excessive Fear Of Physical Movement, Expecting Or Feeling Of Vulnerability To Painful Injury. Functional Ankle Instability (FAI) Is A Condition That Causes Mechanical Alterations To The Ankle Joint And Leads To Disability. The Main Purpose Of The Study Was To Evaluate FAI (Functional Ankle Instability) Using CAIT (Cumberland Ankle Instability Tool).It Is Also Proven That Kinesiophobia Is Present In Patients With Functional Ankle Instability Discriminative Validity Was Tested To Determine Whether The CAIT Could Discriminate Between Subjects With And Without Functional Ankle Instability. The Study Assessment Was Done To See The Effects Of Short Foot Exercises In Kinesiophobia With Patients With Functional Ankle Instability. 20 Males And 20 Females Were Included In This Study Who Had Functional Ankle Instability. The 20 Male Subjects Were Divided In A Group Of Two As In One For The Experimental Study And The Other For The Control Group Study Same Procedure Was Followed For The Females And They Were Further Divided Into Groups. The P-Value Of TSK-11 Pre Male Compared To Post Male It Is Statistically Significant. The P-Value Of TSK-11 Pre Female Compared To Post Female Indicates That The Data Is Statistically Significant. The P-Value Of CAIT Post Male And Female Compared To TSK-11 Post Male And Female Suggests The Result Is Statistically Significant. The P-Value Of CAIT Pre Male And Female Compared To TSK-11 Pre Male And Female Indicates That The Data Is Statistically Significant. The P-Value Of CAIT Post Male And Female Compared To TSK-11 Post Male And Female Indicates That The Data Is Statistically Significant.

Keywords: Short Foot Exercises, Kinesiophobia, CAIT, Functional Ankle Instability,

1. Introduction

Short-Foot Exercise (SFE) Is A Widely Used Balance Training Intervention That Has Been Developed Recently To Improve Ankle Proprioception And To Strengthen The Intrinsic Foot Muscles (IFM) To Elevate And Support The Medial Longitudinal Arch (MLA) Of The Foot And Improve Dynamic Standing Balance SFE Is Performed By Attempting To Pull The Head Of The First Metatarsal Toward The Calcaneus, Without Curling The Toes.¹

The Feet Occupy Only 5% Of The Areas Of The Human Body, They Control Postures Through Afferent Information Obtained Through The Sense Of The Soles, Provide Stability For Maintenance Of Balance, And Absorb Impacts. The Deformation Into Flatfoot Is Induced When The Medial Longitudinal Arch (MLA) Has Descended Because The Arch Had Been Excessively Relaxed To The Extent That The Arch Cannot Be Maintained And Causes The Feet To Be Excessively Pronated Compared To Normal Feet So That Heel Eversion Appears And The Weight Load Is Shifted Inward To Compress The (MLA)⁵

To Correct Flatfoot Issues, Short Foot Workouts And Arch Support Insoles Were Used, And It Was Evident That As The Medial Longitudinal Arch Was Strengthened, So Too Was The Subject's Capacity For Dynamic Balance. Additionally, It Was Evident That Sensory-Motor Training, Such As Quick Foot Exercises, Outperformed Traditional Therapy Options Like Arch Support Insoles. Additionally, It Was Clear That Employing Arch Support Insoles Would Not Be Enough To Improve The Medial Longitudinal Arch Throughout The Six-Week Intervention Period. It Is Required To Conduct Thorough Comparison Studies Integrating Sensory-Motor Foot Training, Arch Support Insoles, And Longer Intervention Periods.⁵ Other Intervention Techniques Include SFE, Which Uses Sensory-Motor Training To Amplify The Intrinsic And Extrinsic Foot Muscles.

A Condition Known As Functional Ankle Instability (FAI) Affects The Ankle Joint Mechanically And Results In Impairment. Understanding The Association Between Physical Causes And Fear Of Movement Is Essential When Assessing And Treating People With FAI. The Current Study Sought To Determine If Kinesiophobia Can Predict JPS And Postural Control In FAI Participants As Well As.¹ The Effect Of Kinesiophobia On Ankle Joint Position Sense (JPS) And Postural Control. [Kinesiophobia, Commonly Known As "Fear Of Movement Or Activity," Is Described As An Excessive Fear Of Physical Movement, Anticipating, Or Feeling Vulnerable To Unpleasant Damage]. When Rehabilitating Individuals With FAI, It Is Important To Take Into Account Kinesiophobia Because It Can Greatly Affect Ankle JPS And Postural Control.

The Study's Primary Goal Was To Assess The Effects Of Short Foot Exercises On Kinesiophobia In Patients With Functional Ankle Instability (FAI) Using The Cumberland Ankle Instability Test (CAIT). Functional Ankle Instability Isn't Just Brought On By One Thing, Like Ligament Elasticity, Muscular Weakness, Decreased Proprioception, Or Postural Control Issues. Ankle Instability, A Complex Neuromuscular Disease That Commonly Occurs In People With Lateral Ankle Sprain, Affects A Substantial Percentage Of Patients. Uncertainty Surrounds The Neuromuscular Mechanism Causing The Pathophysiology Of Ankle Instability. It Is Probable That A Number Of Factors, Including Deficiencies In Open And Closed Loop Regulatory Systems, Contribute To The Development Of Ankle Instability. Freeman First Identified Functional Instability In 1965, Attributing Poor Balance In People With Lateral Ankle Sprains To Damaged Mechanoreceptors In The Lateral Ankle Ligaments That Led To Proprioceptive Deficits.¹¹

In Those With Chronic Pain, The Tampa Scale For Kinesiophobia (TSK) Has Proven To Be A Reliable Predictor Of Physical Functioning And Disability. Both Exploratory Factor Analysis (EFA) And Confirmatory Factor Analysis (CFA) Have Been Used To Analyze The TSK.¹²

Ankle Joint Functional Assessment Tool (AJFAT) And The Functional Ankle Instability Questionnaire (FAIQ)⁸ Are Two Such Instruments. After A Simple Ankle Sprain, People Continue To Experience Discomfort And Instability. Functional Ankle Instability, Mechanical Ankle Instability, And Recurring Sprains Are All Examples Of Chronic Ankle Instability. Mechanical Ankle Instability Occurs When A Primary Mechanical Restraint Is Lost. Ankle Joint Functional Assessment Tool (AJFAT) And The Functional Ankle Instability Questionnaire (FAIQ)⁸ Are Two Such Instruments. Validity By Comparing A Scale To The Benchmark For The Condition Being Investigated, Concurrent Validity Is Often Assessed. To See If The CAIT Could Distinguish Between Participants With And Without Functional Ankle Instability, The Discriminative Validity Of The Test Was Put To The Test. The Test-Retest Reliability Of The CAIT Was Assessed By Giving It To 18 People From The General Population Twice, Two Weeks Apart.⁸

2. Methodology

We Designed An Intervention-Based Study Over A Period Of 6 Months Among Patients With Ankle Instability .Demographic Questionnaire And Informed Consent Form Was Obtained From The Participants Before Recruitment Of Patients To The Study.

The Study Recruited Patients With Ankle Instability With An Age Group Of Young Adults (19-29 Years) Both Genders. Those Who Had A History Of Recurrent Ankle Sprains And Ankle Instability Were Included In The Study.

The Patients With Neurological Conditions, Balance And Co-Ordination Issues, Lower Limb Surgery And

Related Pathology, Associated Fractures In The Study Were Excluded. The Outcome Measures Assessed Were Tampa Scale Of Kinesiophobia (TSK-11). The TSK Is One Of The Most Well-Known Instruments For Measuring Fear Of Movement/ (Re)Injury. Cumberland Ankle Instability Tool (CAIT). The Cumberland Ankle Instability Tool (CAIT) Is A 9-Item 30-Point Scale That Measures The Severity Of Functional Ankle Instability. Using A Numeric Value, The CAIT Has The Ability To Discriminate Between Stable And Unstable Ankles. This Self-Report Questionnaire Allows Patients To Rate Their Perceived Degree Of Difficulty In Performing Different Physical Activities. The CAIT Is Filled Out For Both The Left And Right Ankle, Making It Possible To Assess Both Ankles Individually.

Patients Were Evaluated For Kinesiophobia Using The TSK-11 Scale And CAIT Questionnaire For Ankle Instability According To The Inclusion Criteria And Exclusion Criteria And Were Recruited For The Study. The Male And Female Groups Were Further Divided Into Experimental And Control Groups.

3. Results

TABLE: 1The CAIT Scale Pre Male And Pre Female Compared To TSK-11 Scale Pre Male And Pre Female

CAIT AND TSK-11	MEAN	STANDARD DEVIATION	T-VALUE	P-VALUE
Pre Male (Experimental And Control)	19.7	5.5	-4.8	<0.001
Pre Female (Experimental And Control)	26.0	4.7		

TABLE: 2The CAIT Scale Post Male And Post Female Compared To TSK-11 Scale Post Male And Post Female.

CAIT AND TSK-11	MEAN	STANDARD DEVIATION	T-VALUE	P-VALUE
Pre Male (Experimental And Control)	19.5	5.6	-2.0	0.05
Pre Female (Experimental And Control)	22.4	6.4		

According To Table 1 Shows The CAIT Scale Pre Male And Pre Female Comparison To TSK-11 Scale Pre Male And Pre Female Which Gave A P-Value Of <0.001 Shows That It Is Statistically Significant, The Mean For Pre Male (Experimental And Control Group) Was 19.7 And Pre Female (Experimental And Control Group) Was 26.0 Also The Standard Deviation Was 5.5 And 4.7 For The Following Groups And The T-Value Was -4.8

Tab 2 Shows That The CAIT Scale Post Male And Post Female Comparison To TSK-11 Scale Post Male And Post Male Which Gave A P-Value Of 0.05 Shows That It Is Statistically Significant, The Mean For Post Male (Experimental And Control Group) Was 19.5 And Post Female (Experimental And Control Group) Was 22.4 Also The Standard Deviation Was 5.6 And 6.4 For The Following Groups And The T-Value Was -2.0

4. Discussion

The Ankle Joint Is A Congruent Synovial Joint With A Single Oblique Axis That Transfers Weight To The Proximal Joints And Allows Smooth Movements During Functional Activities.² A Common Injury That May Be Assessed Using Proms Is Ankle Sprains, Which Are The Most Common Sports Injury. Up To 30 % Of People Who Suffer From An Initial Ankle Sprain Experience Persisting Symptoms, Which Can Progress To Chronic Ankle Instability (CAI).³ Ankle Sprains Are A Common Injury Among Physically Active Populations That Can Cause Lasting Damage To The Lateral Ligaments And In Some Cases Chronic Functional Instability. In The United States, Ankle Sprains Occur With An Incidence Of Around 2.15 Per 1000 Person-Years.⁴ It Has Been Shown That Ankle Sprains Can Lead To Chronic Ankle Instability Thereby Affecting The Function Of The Ankle.⁷

Ankle Instability Is A Complex Neuromuscular Disorder, Which Affects A Large Percentage Of Individuals Who Have Lateral Ankle Sprain. The Neuromuscular Mechanism Behind The Pathology Of Ankle Instability Remains Unclear. ¹¹ Chronic Ankle Instability Describes A Combination Of Mechanical And Functional Instability With Residual Ankle-Sprain Symptoms^{2,3}: Pain, Swelling, Weakness, Instability, And Repeated Episodes Of “Giving Way”.⁸ Functional Ankle Instability (FAI) Is A Condition That Causes Mechanical Alterations To The Ankle Joint And Leads To Disability.² Up To 70% People Have Persisting Symptoms Of

Pain And Instability After A Simple Ankle Sprain.¹⁻³ Chronic Ankle Instability, Among The Most Common Symptoms, Is Debilitating And Can Lead To A Wide Spectrum Of Disability.

Chronic Ankle Instability Can Include Recurrent Sprain, Mechanical Instability In Which A Primary Mechanical Restraint Is Lost, And Functional Ankle Instability.⁹ Functional Ankle Instability Is Not Merely A Result Of A Single Factor Such As Ligament Laxity, Muscle Weakness, Diminished Proprioception, Or Postural Control Deficits. Rather, CAI Has Been Found To Be Associated With All These Factors, As Well As Altered Arthrokinematics And Joint Structure At The Talocrural Joint.¹¹

Kinesiophobia, Also Called "Fear Of Movement Or Activity," Is Defined As An Excessive Fear Of Physical Movement, Expecting, Or Feeling Of Vulnerability To Painful Injury.² Fear Of Movement Can Significantly Influence Physical Factors, And Understanding Their Relationship Is Crucial In Assessing And Managing Individuals With FAI.² It May Well Appear As A Fear Of Physiological Symptoms Of Fatigue Or Exhaustion Or, Even More Comprehensively, Fear Of Physical Or Mental Discomfort Psychotherapeutic Intervention.¹⁰ Taking Into Consideration All Remarks Mentioned Above, A New Diagnostic Tool Was Developed And Is Proposed In This Article, Named Kinesiophobia Causes Scale (KCS). It Is Devised For An Adult Population And Aims To Diagnose Original Causes Of Motor Passivity. Such A Construct Allows To Diagnose Individual Causes Of Kinesiophobia And Their Intensity In The Two Domains Separately, As Well As To Calculate The Total Score Of KCS.¹⁰ The Fear Avoidance Model Has Contributed Greatly To Our Understanding Of The Role Of Pain-Related Fear In Chronic Pain And Pain-Related Disability. Within This Conceptual Framework, Fear Of Movement/ (Re)Injury, As Measured By The Tampa Scale For Kinesiophobia (TSK) Has Been A Robust Predictor Of Physical Functioning And Disability In Individuals With Chronic Pain.¹² TSK Have Been Investigated Using Both Exploratory Factor Analysis (EFA) And Confirmatory Factor Analysis (CFA).¹²

Hiller Et Al. Designed The Cumberland Ankle Instability Tool (CAIT). It Was Originally Developed In English And Proved To Be Of High Content Validity And Good Reliability. The Main Advantage Of The Questionnaire Is That It Consists Of Only 9 Items, Minimizing Patient Burden And Increasing Reliability. The Precision Of The Instrument Is Increased As It Is A Multiple Answer Option Instrument. The CAIT Is Filled Out For Both The Left And Right Ankle, Making It Possible To Assess Both Ankles Individually.³

Short-Foot Exercise (SFE) Is A Widely Used Balance Training Intervention That Has Been Developed Recently To Improve Ankle Proprioception And To Strengthen The Intrinsic Foot Muscles (IFM) To Elevate And Support The Medial Longitudinal Arch (MLA) Of The Foot And Improve Dynamic Standing Balance.¹ SFE Is Performed By Attempting To Pull The Head Of The First Metatarsal Toward The Calcaneus, Without Curling The Toes.¹ The Short Foot Exercises Training Significantly Improves Proprioception And Dynamic Balance In Patients With CAI Who Have Experienced Recurrent Ankle Sprains, And It Was More Effective Than PSE Training. Inclusion Of Sfes Could Accelerate Recovery From Ankle Sprains And Prevent The Development Of CAI, As Well As Facilitating A Faster Return To Activities Of Everyday Life And Sports.¹

The Study Assessment Was Done To See The Effects Of Short Foot Exercises In Kinesiophobia With Patients With Functional Ankle Instability. 20 Males And 20 Females Were Included In This Study Who Had Functional Ankle Instability. The 20 Male Subjects Were Divided In A Group Of Two As In One For The Experimental Study And The Other For The Control Group Study Same Procedure Was Followed For The Females And They Were Further Divided Into Groups. The Age Group Included In The Study Was 19 To 29 Years. The Mean Age For Females Were 22.9 And For Males Were 24. The Comparison Between The Two Sex Groups Male And Female In Experimental Group Was Highly Significant. The BMI Classification Had Patients With Different Weight Categories As Well. In This Study The Functional Ankle Instability Was Mostly Seen On Left Side As Compared To The Right Side.

The Results Of CAIT Scale Post Compared To TSK-11 Scale Post The Results Are Statistically Significant. Thus, Docherty And Arnold Argued That Proprioceptive Sensory Training Should Be Considered As An Essential Component Of The Rehabilitation Of Patients Following An Ankle Injury. Zang Et Al. Argued That Deficits In Ankle Proprioception Could Impair The Functional Stability Of The Ankle Joint, As Well As Playing A Role In Impairment Of The Somatosensory Control Of Balance. For These Reasons, We Sought To Evaluate The Relative Efficacy Of SFE And PSE In Improving The Sensory Function Of The Ankle In Patients With CAI.¹ In The Present Study Patients With Functional Ankle Instability Were Evaluated With The Help Of CAIT AND TSK-11for Kinesiophobia. When CAIT Pre Male Was Compared To Post Male It Indicated It Is Statistically Not Significant ($P=0.8$). The Results Of CAIT Pre Female Compared To Post Female It Indicated It Is Statistically Not Significant ($P=0.8$). When TSK-11 Pre Male Was Compared To Post Male It Is Statistically Significant ($P<0.001$). When TSK-11 Pre Female Compared To Post Female It Indicates It Is Statistically Significant ($P=0.05$). When CAIT Post Male And Female Compared To TSK-11 Post Male And Female Suggests The Result Is Statistically Significant ($P=0.05$). The Patients With FAI Had Kinesiophobia And Inculcating One Of The Treatments Such As Short Foot Exercises To Treat Functional Ankle Instability Does Increase Stability And Reduces Instability And Reduces Effects Of Kinesiophobia.

5. Conclusion

It Can Be Concluded From This Study That Kinesiophobia Is Present In People Having Functional Ankle Instability, It Is One Of The Cardinal And Residual Symptoms Present In People Having Functional Ankle

Instability. Inculcating Short Foot Exercises As One Of The Treatments To Treat Functional Ankle Instability Can Gradually Reduce Functional Ankle Instability And Have A Better Impact On Effects Of Kinesiophobia. Short Foot Exercises Can Reduce Kinesiophobia And It Is Effective For Managing Functional Ankle Instability.

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Conflicts Of Interest

There Are No Conflicts Of Interest So Far.

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