



A LITERATURE REVIEW TO FIND OUT THE EFFECTIVENESS OF JACK KNIFE STRETCHING IN HAMSTRING TIGHTNESS

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ABSTRACT

BACKGROUND: Flexibility is crucial for continuation of working of Musculoskeletal system. Muscle tightness is due to reduce in capacity of contractile structure of muscles to deform. Hamstring tightness put individuals on high risk of recurrent injury, delay return to play, reduce power performances, prone to post exercise muscle soreness and affects team work among sports team. Hamstring tightness make patient prone for low back pain or low back injuries and also affects lumbo-pelvic rhythm. Reduced activity at lumbo-pelvic level leads to postural distortion which develop compensatory motion that's alter spinal soft tissue mechanics and increase risk of disc herniation. Jack Knife stretching is used to increase the flexibility of tight hamstring. It can be performed by patients themselves as self-stretching technique; patient can do this self-stretching both as static and dynamic stretching and they can modify the stretching by adding objects or weights or can be done without any weight.

There are articles which suggests Jack Knife may be effective exercise technique for Hamstring Tightness but strong evidence yet to be discussed. This study on jack knife stretching is going to fulfill the progression achieved by this stretching and to search more strong points to suggest the stretching for future use.

OBJECTIVE: To find out the strong evidence which support the use of mentioned stretching technique in reducing tightness of back thigh muscle and improving functional task and quality of life.

RESULT: Articles shown that Jack Knife stretching is effective in reducing Hamstring muscles tightness and restoring flexibility at knee joint.

CONCLUSION: This literature review analysed Jack Knife stretching for Hamstring Tightness. Many types of reviews used to suggest that to decrease the stiffness between muscle and tendon junction and for this purpose we can go safely with Jack-Knife stretching for Hamstring and hence reduce Hamstring tightness. The guidelines given in this review will help us to get premium quality of results and also determine the true effectiveness of Jack Knife stretching as increases flexibility in Hamstring tightness.

KEYWORDS: Jack Knife stretching, ADL (Activity of Daily Living), Flexibility, Osteoarthritis, Osteoporosis, Muscles-Tendon unit stiffness.

INTRODUCTION

Muscles situated at back of thigh also called as Hamstring muscles group. These muscles act as knee flexors and hip extensors and it crosses hip and goes up to knee joint hence is work as two joint crossed muscles. Any kind of change in muscles fiber whether in eccentric or concentric load, the joints crossed by these muscles get affected. There can be observable posterior tilting of pelvic part due to muscle fiber shortening. Continuous tightness of these muscles provokes low back pain which restrict daily activities (ADL), decreases quality of life, affects performance in sports playing athletes and risk factor increases for further injury on ground¹

Tight muscle like hamstring muscles were reported as risk factors for musculoskeletal dysfunction such as low back pain, disc herniation, Osgood-Schlatter disease and lumbar spondylolysis, mainly in young adult. Flexibility of thigh muscles could be important for preventing physical disability or disorder, provide range free motion, reduce tightness and joint stiffness. From studies it has been described three types of stretching for muscles such as, static, dynamic and precontraction stretches²

Adapting sedentary life style led to tightness as reduction of physical activeness which gives birth to stiffness long term drawback of sedentary lifestyle

may be osteoarthritis, osteoporosis and causes injury with strenuous exercises mainly without proper warm up. So, in this condition of tightens, stiffness or injury reduction of load on muscles, tendons or muscles- tendon unit is crucial because in loaded phase the demand of energy absorption by muscle or tendons or together is very impactful put tissues on risk of injury. Stretching's like Static and dynamic stretching are effective in reducing the tightness and stiffness of the hamstring muscles tendon junction or over the belly of muscles. Studies have shown a different type of stretching i.e., jack knife stretching which is more appreciated when it comes in terms of flexibility and overall lower limb flexibility. This review of literature focuses on finding the benefits of Jack knife stretching with hamstring tightness³ individuals.

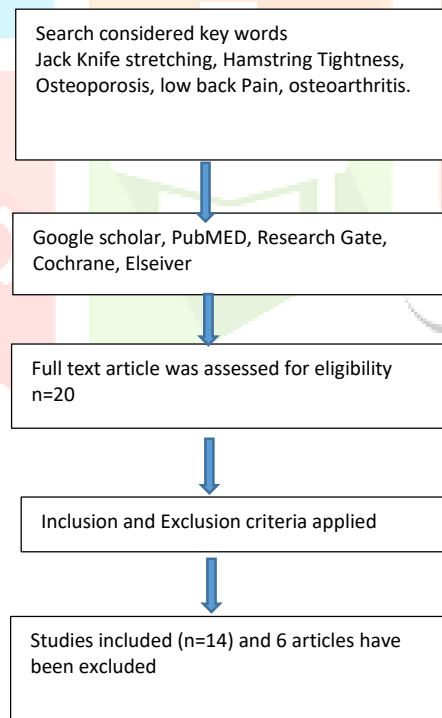
JACK KNIFE Stretching is self-stretching technique which performed actively by patients that effectively enhances tight hamstring muscles elasticity and make muscle flexible. It is an active type of stretching technique, which can be performed statically or with movements like dynamic stretch and also can be modified with adding equipment, previous studies so far supported that high-intensity Jack-Knife stretching is a beneficial and safe procedure in reducing muscles or tendons stiffness of the Hamstring. As Hamstring tightness affects the athlete's performances rate and flexibility of overall joints and also said to put major lower limb joints more prone to serious injuries especially in athletes. so, there's need for study more on jack knife stretching technique⁴ Objective of this study is to show Jack-Knife stretching improve performance in hamstring tightness by improving flexibility of hamstring muscles.

procedures:

Participants will be in squatting position along with wrapping their hand around ankle joints, this considers as starting position and then while making the contact between thoracic and anterior thigh throughout the procedure and also the relation between hand and their ankles should maintain, participant perform extension motion at knee joint actively as per the guidance by therapist³

METHODOLOGY

STUDY FLOW DIAGRAM



LITERATURE SEARCH METHODOLOGY

Google Scholar, Pub Med, Research gate and Science directs are the search engine available online for collection of articles. The author found texts on the basis of keywords. In full texted articles collection, which is total of 15 out of 15, 11 were chosen for review.

STUDY SELECTION DATA EXTRACTION

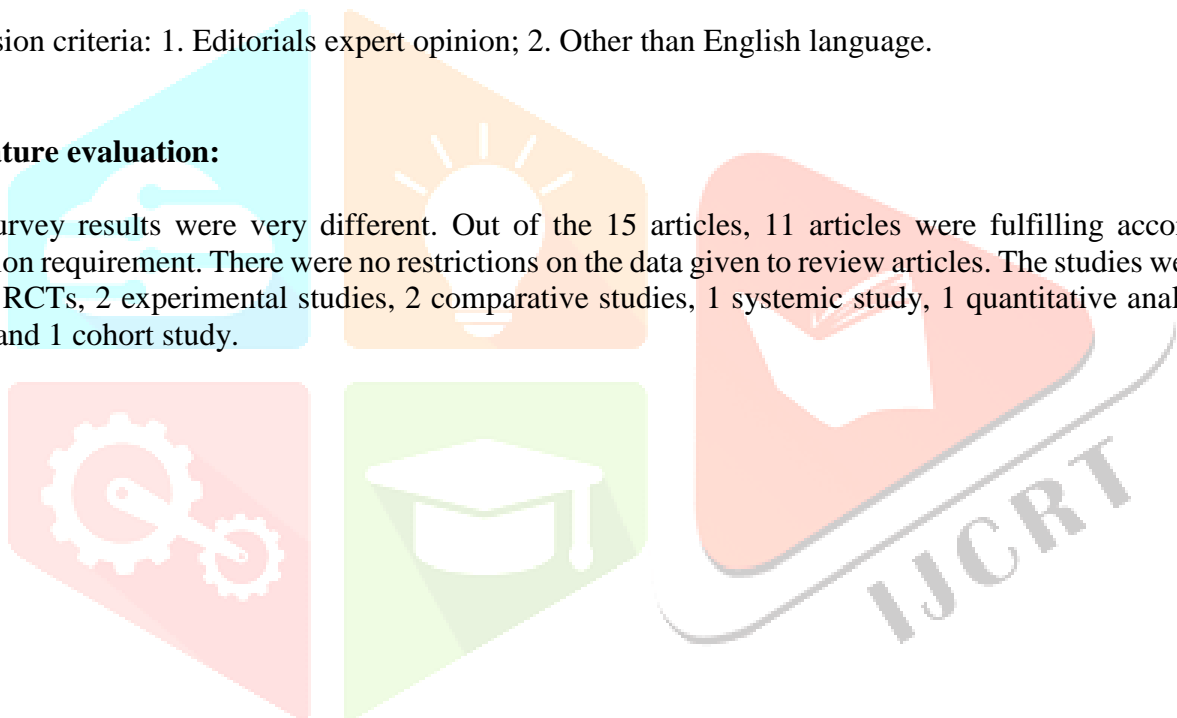
Study design, results obtained, conclusion gained all data so far collected were arranged in chronological order and provided in tabular form.

Inclusion requirement: 1. Published in languages such as English; 2. Jack Knife stretching; 3. Published in journals with peer review only; 4. Study were including human participants.

Exclusion criteria: 1. Editorials expert opinion; 2. Other than English language.

Literature evaluation:

The survey results were very different. Out of the 15 articles, 11 articles were fulfilling according to the inclusion requirement. There were no restrictions on the data given to review articles. The studies were collected into 3 RCTs, 2 experimental studies, 2 comparative studies, 1 systemic study, 1 quantitative analysis, 1 pilot study and 1 cohort study.



REVIEW OF LITERATURE

SLN	AUTHOR	YEAR	TYPE OF STUDY	RESULT	CONCLUSION
01	Junsuke Waskase, Kinturo Sasaki, et al	2021	Cohort type of study	Increases the ROM at the end and decreases the muscles and tendon stiffness of hamstring.	increased ROM of knee joint and decrease stiffness of hamstring.
02	Danielsson A, Horvath A, et al.	2020	Systemic type of review	Injuries occurs at the terminal swing phase while running	Because of muscle injury caused by eccentric load during the terminal swing phase while running gait.
03	Takeuchi K, Akizuki K and Nakamura M	2021	Experimental study	Comparative flexibility enhanced in hamstring group of muscles.	Before and after exercise, stretching shows better flexibility and reduce chance of muscle fatigue.
04	Kabra, Amruta, Salekar, Kaja; and Kalanekar Tanvi	2020	RCT	Jack knife stretching technique was more beneficial than PNF technique,	Jack knife stretching provide quick benefits due to closed pack position of stretching compared to open pack position of PNF technique.
05	Huygaerts S, Cos F, et al.	2020	Comparative study	With over exertion it appears that lower extremity stiffness reduces which can cause the adoption of a Groucho running pattern, associated with decreased movement.	The hamstring muscles produce counter coup forces during high-intensity running along with the producing knee dynamically stable.
06	Voichi sairy, Takushi K, et al.	2013	Pilot kind of study	Significant difference found in subjects after the	JK stretch technique is a useful self-static stretching

				technique by improving low back pain and increasing flexibility of muscles.	technique to increases flexibility of hamstring.
07	Roland van den Tillaar, Jens Asmund Brevik So, et al.	2017	Comparative study	The laying kick along with Nordic hamstring exercise and its modification had maximum muscle activation, while the cranes showed the lowest muscles activation.	Nordic hamstring exercises technique with its modification together with the Laying kick activates the hamstring while cranes did not reach high levels of hamstring activation compared with sprinting.
08	Jin-Oh Ahn, Jong-Hyuck Weon, et al	2020	RCT	results were calculatively greater in the intervention group than in the control group.	the use of a PBU recommended to maintain the pelvic anterior tilting position when performing the AKE test or AKE stretching.
09	Mandeep Kaur, Rajesh Paul, et al	2010	RCT	There was significant difference observe in ROM between pre and post values of both the groups.	Group B participant shown observable improvement than group A in ROM.
10	Jae-Seop Oh and Min-Hyeok Kang	2020	Experimental study	hamstring stretching increased the knee extension angle during various motion at knee joint.3	PNF and JK stretching have similar efficient benefits on hamstring flexibility.
11	Masahiro sato, Yasuyaski Mase, and Kaichi Sairya	2017	Systemic study	Tightness was relived in maximum population out of given participant.	Home-prescription for active stretching was beneficial for getting rid of

					tightness of muscles in the leg for pediatric population.
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RESULT

Articles shown that stretching technique like jack knife is beneficial in reducing Hamstring muscles tightness and restoring flexibility at knee joint.

CONCLUSION

This literature review analysed Jack Knife stretching for Hamstring Tightness. Many types of reviews used to suggest that Jack-Knife technique of stretching is an impressive and secure method to decrease muscles and tendons tightness of the Hamstring and hence reduce Hamstring tightness. The prerequisite mentioned in this review will provide us to get premium quality of aftermath and also complete the real influence of Jack Knife stretching for increases flexibility in Hamstring tightness.

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