



# ASSESSING THE FACTORS OF AN OPTIMAL INSOLE



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## ABSTRACT

The improper structure and feature of the shoes' insoles induce instability with their overall gait, walking pattern, and discourages active walking (Nagano & Begg, 2018). Considering the factors needed to generate the ideal insole like proper measurements, proper design structure, and adequate materials, people can avoid common injuries caused by uncomfortable insoles like foot pain.

This research aims to determine whether the insoles provide beneficial effects to healthy normal people dealing with extreme lower extremity movements and those who have sedentary jobs that are experiencing pain within their feet. Included in this study is assessing factors that would make an optimal insole in relation to comfort and durability. This will be done through a systematic review of related literature concerning the previous study findings.

At the end of the study, this paper aims to recommend what factors are best suited for creating an optimal insole. The researchers conclude the presence of benefits or positive effects that the use of insoles pose to its user. The results suggest the existence of advantages or beneficial effects that the use of insoles poses to the customer. Following trials with polyurethane, steel, and silicone insoles, improvements in knee flexion, ankle dorsi flexion, and increases in stride length were observed. But, the same effect cannot be suggested to postural sway.

## INTRODUCTION

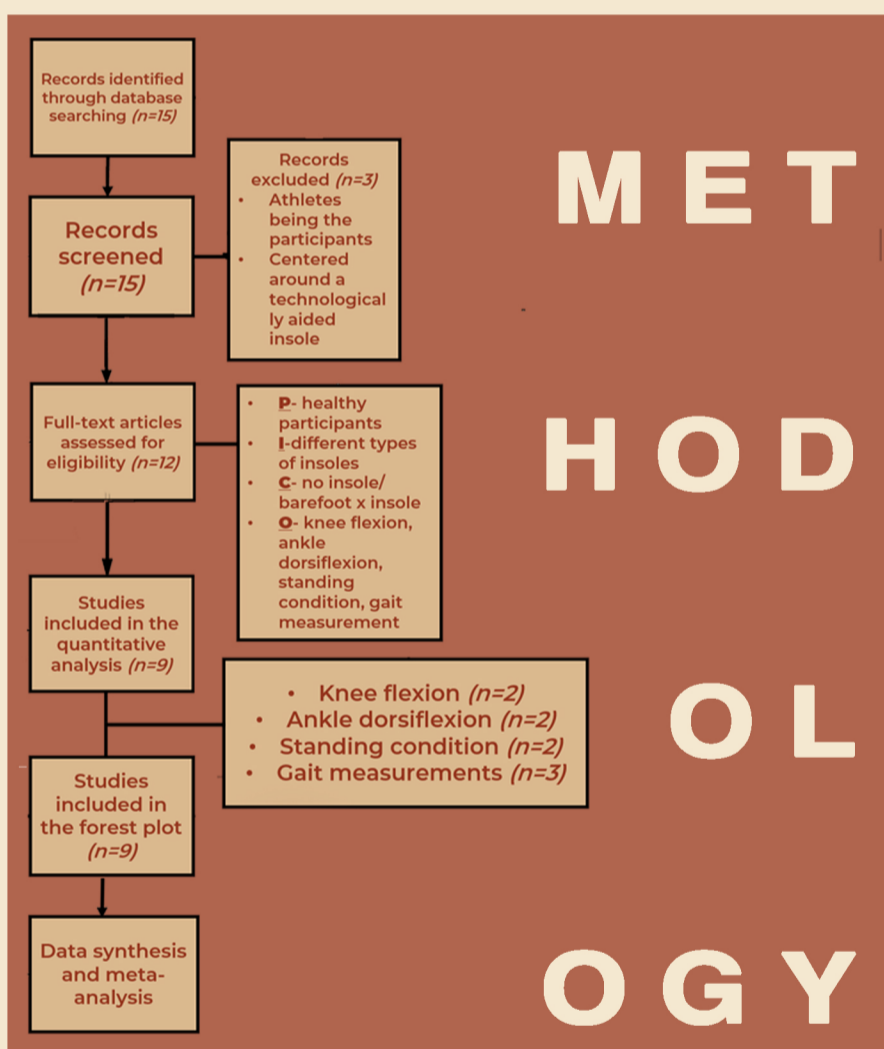
Shoe insoles have been around a long time. They are also used for orthotics in treating foot pathology and deformity. Production of shoes has neglected the importance of proper design, thus making insoles needed now more than ever.

### Statement of the problem

- With some shoes lacking proper shoe insoles, specific to targeting the appropriate repositioning of feet for relief, people struggle in activities that require active participation; this includes inactivity of muscles when passive in extended periods.
- Some insoles being structurally imbalanced, people who neglect the condition of their insoles still resort to using them.

### Objectives

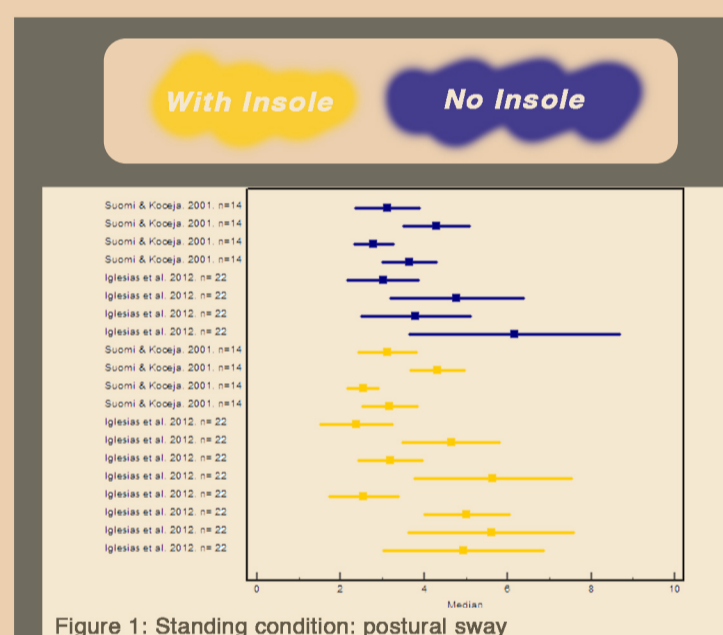
1. Determine if insoles are safe and do present long term beneficial effects.
2. Collect information on the designs and technology of insoles used in daily activities that provide the most comfort and/or decrease pain.
3. Recommend insole designs and technology that promotes comfort and durability and proper use of insoles.



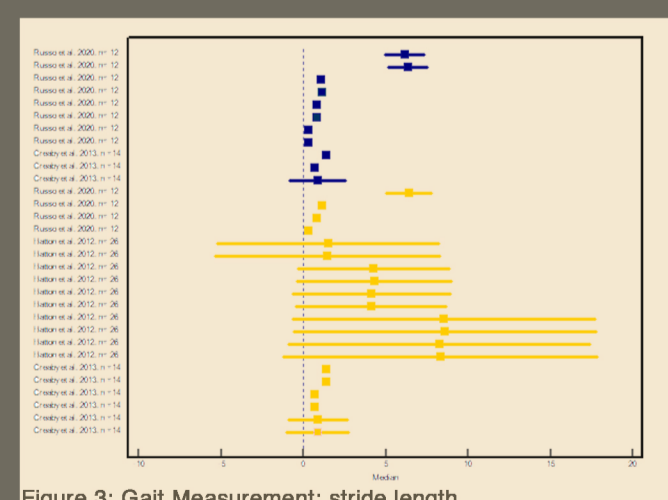
## CONCLUSION

The researchers conclude that there is the presence of benefits or positive effects of the use of insoles to its user based on improvements in knee flexion, ankle dorsiflexion and gait measurement, specifically to stride length. However, the same cannot be suggested to standing condition, specifically postural sway, as it is shown that there is no distinction between the two conditions. In spite of the unsatisfactory results for the standing condition, it can be inferred that the benefits of these insoles are specifically manifested with the walking conditions, namely knee flexion, ankle dorsiflexion and gait measurement (stride length). The insoles included in the studies were polyurethane, steel, and silicone insoles. Improvements to different areas of activities conducted in these experiments are most observed with these said types of insoles.

## CONCLUSION



This shows that the results of experiments with insole condition are significant, as more intervals do not cross with the line of no effect. It is suggested that improvements in the knee flexion were observed with the experiment that used different insoles. These insoles are made of polyurethane, steel, and silicone. Designs such as flat insole and heel-cup insole were also utilized in these experiments. All the more, it is suggested here that there is a significant reduction of knee flexion in insoles made of polyurethane in comparison to barefoot condition



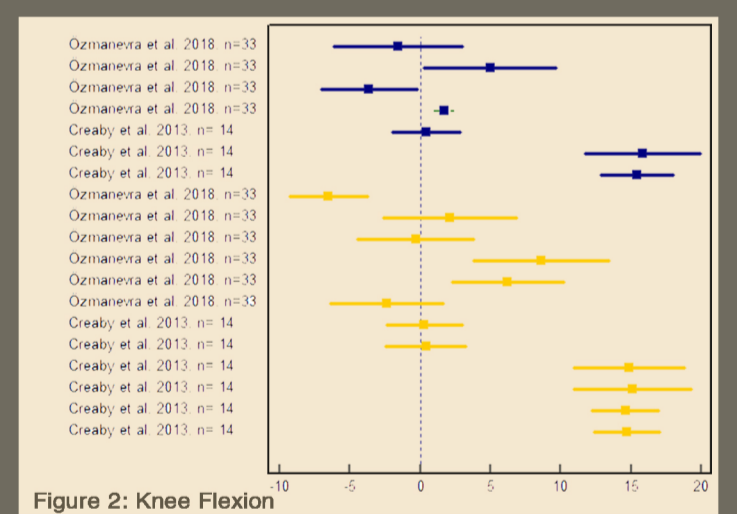
The graph exhibits a result that is significant with respect to experiments that made use of different insoles. It is suggested that barefoot condition presents a maximum ankle dorsiflexion, while least maximum plantar flexion was demonstrated by the steel insole.

## RESULTS

### STANDING CONDITIONS: Postural Sway

The results for the standing conditions do not necessarily specify a distinction between the insole and no insole conditions. This means that both these conditions do not present evidence of the harm or the benefit upon the usage of these insoles

### KNEE FLEXION



### GAIT MEASUREMENTS

The graph shows significant results with the experiments that made use of insoles. This would suggest that the usage of insoles render an increase in stride length, as there is the provision of cushioning systems provided by the different insoles. This strengthened the claim that insoles do provide improvement in the biomechanical stability of the user, as external perturbations were somehow prevented.

### ANKLE DORSIFLEXION

