

# COMPARISON OF PLANTAR PRESSURE DISTRIBUTION IN DOMINANT AND NON-DOMINANT LEG OF FEMALE KARATE NATIONAL TEAM (KATA & KUMITE)

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## Introduction

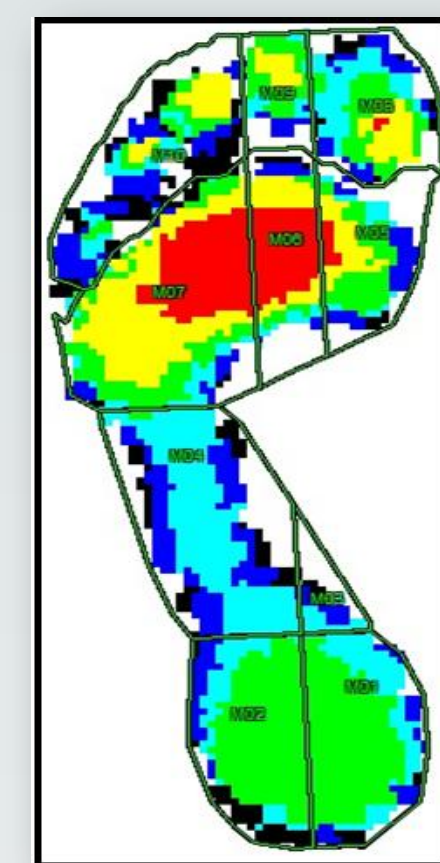
Individual sporting disciplines have different levels of impact on the morphological structure and active efficiency of the foot. The state of the feet of sportsmen depends significantly on the type of effort and the weight of the load carried, which differs in different disciplines, and depends on the type of surface on which training and competition are conducted (Lichota, 2013). Karate is one of martial arts with a unilateral guard which is consist of one leg weight bearing nature along by vary jumping movements (Fong, 2013). Repeating of techniques in training, especially at the elite level, makes difference exercises carried out by the dominant and non-dominant leg in the long term; but researches exploring the impact of these repeating skills are infrequent. On the other hand, Karate training is done as kata (complex techniques without opponent) and kumite (fight a real opponent) (Filingeri, 2012). There is an apparent lack of data regarding the differences between kumite and kata competitors, espeisaliy in female athlates. Not paying enough attention to the nature of sport activities in choosing professional sports will cause wasting of time, cost and talent. Measurements of plantar pressure provide an indication of foot and ankle function during gait and other functional activities (Orlin, 2000). Thus the aim of this study is to compare plantar pressure distribution in dominant & non-dominant leg of female kata and kumite participating in international competitions.

## Method

12 Kumite and 8 Kata female athletes participating in international kata and kumite competitions counterpart in this study. The leg which was preferentially used to perform the techniques, known as karate-ka dominant leg. Plantar pressure were measured using emed platform during barefoot walking at a self-selecting pace in 3 trails for every foot.

After dividing the foot into 10 masks (PRC division), peak pressure, pressure-time integral, maximum force, and force-time integral were calculated.

Wilcoxon and U-Mann-Witney tests were used to compare parameters between two legs and two groups at 0.05 significance level.



## Results

Plantar pressure parameters had significant difference between kata and kumite in Metatarsal-2 ( $p=0.050$ ) and Metatarsals-3,4,5 ( $p=0.04$ ); and between the dominant and non-dominant leg in Metatarsal-2 ( $p=0.03$ ), big-toe ( $p=0.04$ ) and Toes-3,4,5 ( $p=0.04$ ).

## Conclusion

Results indicated different nature of two athletic fields that Kumite has higher impact on plantar pressure due to its trainings' higher mechanical loading (Teodoru, 2014). Kumite-ka has constant, repeated and short jumping often on the forefoot. Over time, this type of support is likely to change the pattern of plantar pressure and leads to increased metatarsal peak pressure and max force.

Also, unequal use of legs' effect on plantar pressure because of leg dominance and impact of such long-term preferred on the distribution of pressure at small area of foot was determined. Metatarsal-2 in dominant leg and Bigtoe in non-dominant leg are highly susceptible to injuries caused by overuse; so preventive trainings seem necessary.

## References

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