SHORT COMMUNICATION

©2023 The Academy of Environmental Biology, India

Journal of Ecophysiology and Occupational Health, Vol 26(1), *DOI: 10.18311/jeoh/2026/49263, 7-13, March 2026*

ISSN (Online) : 0972-4397
ISSN (Online) : 0974-0805

Physical Characteristics of Ankle and Foot Complex in Cab Drivers in Bangalore

Shivani Jain, Laxmi Ghimire, Sweta Rauniyar, Rachel Sandeep Marwaha and Nidhi Sharma*

Krupanidhi College of Physiotherapy, Bengaluru - 560035, Karnataka, India; nidhisangarkcpt@gmail.com

Abstract

Background and Objective: The ankle foot complex is meant to provide coordinated synergy of both its intrinsic and extrinsic muscles, which is fulfilled by the mobility and stability component of this joint. Any deviation in the normal biomechanics and functions of the foot and ankle complex affects the professional efficiency of a drivers. Cab drivers covering long-distances experience repetitive stress on the ankle and foot to a larger extent and hence may develop and experience various foot and ankle dysfunctions. The aim of this study is to explore the physical characteristics of ankle and foot complex in cab drivers across Bangalore. **Materials and Methods**: Male cab drivers within the city with Functional Foot and Ankle Disability Index (FADI) score of more than or equal to 100 were included in the study. Their ankle ROM, ankle muscle strength, length of dorsiflexors and plantarflexors and foot angles along with navicular drop were recorded. **Results**: The results showed that plantarflexors were shortened (p value 0.04) with slight restriction in the ROM of dorsiflexion along with the weakness of the dorsiflexors in these cab drivers whereas the foot angles were not affected significantly. **Conclusion**: Thus, the physical characteristics of the ankle-foot complex are influenced by the prolonged long-distance driving.

Major Findings: Prolonged period of driving reduces dorsiflexion range of motion and its muscle strength along with increased plantarflexion tightness with no effect on the foot angles and the navicular drop

Keywords: Ankle Foot Complex, Cab Drivers, Forefoot Angle, Hindfoot Angle, Muscle Strength, Navicular Drop, Range of Motion

1. Introduction

The human ankle-foot complex consists of ankle joint and the foot segment. The complex plays an important role in the biomechanics of lower extremity especially locomotion[1]. The foot and ankle complex, made up of the 26-foot bones form a thirty-three joints complex including the long-bones of the lower limb. Ankle often referred to the talocrural joint (proximal articulation of distal tibia and fibula and distally body of the talus) includes talocalcaneal and talocalcaneonavicular joint[2]. The ankle foot complex is required to provide coordinated synergy of both its intrinsic and extrinsic muscles, which is fulfilled by the mobility and stability component of this joint[3]. As the most terminal part of the lower kinetic chain, its arthrokinematics impacts the ability of the lower limb to enhance the weight bearing in the stance phase, by appropriate distribution and dissipation of the compressive forces, tensile strength, shearing forces, and rotatory forces[4]. This force attenuation is a joint effect of normal foot biomechanics, muscle, bone, ligaments, and other soft tissues.

The primary motions at the ankle joint are dorsiflexion and plantarflexion. Normal ankle range of motion for

**Author for correspondence*

Article Received on: 03.04.2025 Revised on: 22.10.2025 Accepted on: 30.10.2025

plantar flexion is 50 degrees and for dorsiflexion is 20 degrees[1]. Any deviation in these ranges affect various functions of the foot and ankle complex thereby affecting the activities of daily living and also the professional efficiency e.g., sports person or a marathon runner and likewise. One such profession which highly involves the ankle foot complex is driving[5].

Owing to the advent on online cab aggregators, cabs became move accessible to common man in around 2013[6]. Bengaluru alone has been reported to have a total of 40,000- 45,000 cab drivers between both the Uber and Ola cabs platforms[7]. These Professional drivers are at a high risk of developing Musculoskeletal Pain (MSP) due to the vocational ergonomics such as sitting for a long period of time, awkward postures, whole body vibration and repetitive foot and ankle movements[8]. MSP such as shoulder pain, knee pain, back pain, and neck pain are reported among the professional drivers[5,8,9]. Studies have shown high prevalence of MSP amongst cab drivers due to prolonged static postures and vibrating environment in this population[10].

Driving can result in lower limb problems causing fatigue and altered sensorimotor control of the foot muscles which are repetitively stressed to control the speed of the vehicle using brakes and accelerator[11]. Repetitive switching of the foot between accelerator (speeding), clutch (gear change) and brakes (stopping) for a prolonged period of time (like long distance driving for months together) puts an undue pressure on the ankle and foot complex thereby altering the normal foot biomechanics. Also, whenever there is a sudden stepping on the brake-pedal during driving, excessive external force is applied on the driver's foot causing ankle and foot issues[12]. All these factors exert an undue stress on the ankle foot complex resulting in the prevalence of various MSDs like corns, hammer toe, callosities etc[5].

Cab drivers covering long-distances would experience this repetitive stress on the ankle and foot to a larger extent and hence may develop and experience various foot and ankle dysfunctions. There is a dearth of literature exploring the foot and ankle complex parameters in cab drivers and hence the need for this study. The aim is to study the physical characteristics of ankle and foot complex in cab drivers across Bangalore. This study intends to measure the range of motion of the ankle, muscle strength and muscle length of dorsiflexors and plantarflexors and the foot angles including the navicular drop.

2. Materials and Methods

The ethical clearance was obtained from the ethical committee of Krupanidhi College of Physiotherapy. Subjects from various taxi stands in Bengaluru were screened using the Functional Foot and Ankle Disability Index (FADI) score[13]. 353 cab drivers with the FADI score of more than or equal to 100 were enrolled based on the inclusion criteria (23-40 years old male cab drivers with minimum 5 years of professional driving experience, driving for at least 350 kms/day or minimum 10 hours of driving each day within the city). The subjects with the history of musculoskeletal disorders or surgery of foot and ankle, limb length discrepancies, neurological dysfunctions or any recent ankle foot injury were excluded. Drivers using automatic cars or with any major car modifications were also excluded from the study. Informed consent was taken from all the subjects after a thorough explanation of the study, its necessity and relevance.

The Range of Motion of Plantarflexor (ROM-PF) and Dorsiflexors (ROM-DF), Muscle strength of Plantarflexors (MMT-PF) and Dorsiflexors (MMT-DF), muscle length of plantarflexors (ROMi-PF) and Dorsiflexors (ROMi-DF) along with the Forefoot Angle (FFA), Hindfoot Angle (HFA) and Navicular Drop (ND) were assessed. All the parameters were measured thrice and the average of three was taken as the final reading.

2.1 Ankle ROM

Ankle ROM were checked using goniometer[14]. The subjects were taken in supine lying with ankle in neutral position. Mobile arm of the goniometer was aligned along the 5th metatarsal and the stationary arm was aligned with shaft of fibula. After the goniometer placement the subjects were asked to do active ankle dorsiflexion and readings were noted.

To measure the range of motion of plantarflexion, the subject was made to do active plantarflexion in the same position and the readings were noted.

2.2 Ankle Muscle Length

Ankle muscle length was tested using the digital inclinometer[15,16]. In this method the subjects were in prone lying with 90 degrees of knee flexion. The device was positioned on the lateral side of the foot (aligned with 5th metatarsal). Subject was asked to perform ankle plantarflexion to check for the tightness of dorsiflexors

and ankle dorsiflexion to check for the tightness of plantarflexors. Readings were noted.

2.3 Ankle Muscle Strength

Ankle muscle strength was tested with the hand-held dynamometer[17]. In this method, the subjects were in supine lying. To measure the dorsiflexion, the device was placed proximal to the toes (dorsum of the foot) and the leg was stabilized by the other hand. Subjects were asked to dorsiflex at the maximum range with maximum force against the resistance provided by the therapist using the dynamometer. The readings were noted. In the same position, the plantarflexion was measured with the dynamometer placed at the metatarsal head (on the sole) and patient was asked to plantarflex against resistance. Three dynamometer readings were taken and the mean was calculated.

2.4 Forefoot Angle

For the evaluation of the forefoot alignment, subjects were taken in prone lying, with one hip and knee extended and the foot outside the examination table at the ankle level[18,19]. The other leg had knee at 90 degrees of flexion to place the calcaneus of the limb to be examined on the extended leg. A line bisecting the lower one-third of the leg was drawn on the extended leg, and another line bisected the calcaneus. The angle between these two lines gave subtalar neutral. The subtalar joint was held in the neutral position to measure the alignment of the forefoot using a universal goniometer. The examiner maintained the subtalar neutral position with one hand and with the other hand aligned the goniometer such that the fixed arm was perpendicular to the bisection of the calcaneus, and the moveable arm was parallel to an imaginary line drawn through the metatarsal heads. The degree of forefoot valgus was marked as negative whereas varus was given a positive marking with no marking to zero degree.

2.5 Hindfoot Angle

Subtalar neutral was palpated in standing[19]. The foot template was marked with the chalk to ensure the reliability of measurements. The subtalar neutral angle was measured using the goniometer by noting the reading of the angle formed by the line bisecting the lower one-third of the leg and another line bisecting the calcaneus. To measure the hindfoot angle, subjects were made to stand on single leg flexing the opposite knee (support of the rails for balance was allowed) maintaining the STN in the foot template. The immovable arm of the goniometer was placed parallel to the ground and the movable arm perpendicular to it. Hindfoot varus / valgus was measured by aligning the movable arm with the line bisecting the calcaneum. Varus was positive and valgus was marked negative.

2.6 Navicular Drop

Navicular drop was measured using Brody's technique[1,18,19]. With the subject in standing (feet shoulder width apart), the head of the talus was palpated and and subject was asked to roll the foot medially and laterally until the head of the talus was felt equally on both the sides, to place the subtalar joint in neutral position. The investigator palpated and marked the navicular tuberosity using a small ruler placed vertically from the navicular tuberosity (marked with a pen) to the floor with the foot in the subtalar joint neutral position. The subject then stood on one leg with opposite knee flexion (support of hand railing was allowed). The navicular tuberosity was again palpated and marked in a different color. The subject then relaxed the foot and the height of the navicular tuberosity from the floor was re-measured. Navicular drop was measured as the difference between these 2 measurement values (mm).

3. Results

Statistical analysis was done using the software SPSS 21.0. One sample t test was used to compare all the parameters.

Table 1 indicates that Range of Motion of plantarflexion using goniometer in the Left and the Right Foot. The study included 352 subjects who were all right side dominant. The FADI score of more than 100 was considered to be normal wherein the subjects had no complaints in the foot and ankle complex. The result indicates that bilateral plantarflexion (using goniometer) is within the normal range (Table 1) for both left (mean 48.56±6.26) and right foot (mean 48.23±5.46) with no statistical significance ($p = 0.46$) when compared with the normal plantarflexion of 50 degrees[1].

Table 2 indicates that Range of Motion of dorsiflexion using goniometer in the left and right foot. Table 2 indicates that on comparing with the normal mean value of ROM of dorsiflexion i.e. 20

Table 1. Mean ROM-PF comparison with normal mean values

One-Sample Statistics test value = 50			
	Mean	Std. Deviation	p
ROM- PF Left	48.56	6.26	0.46
ROM- PF Right	48.23	5.46	0.41

Table 2. Mean ROM-DF comparison with normal mean values

One-Sample Statistics test value = 20			
	Mean	Std. Deviation	p
ROM DF Left	19.23	3.48	0.43
ROM DF Right	18.33	2.45	0.01

Table 3. Mean ROMi-PF comparison with normal mean values

INCLINOMETER: One-Sample Statistics test value = 34.54			
	Mean	Std. Deviation	p
ROM - PF Left	38.23	10.14	0.23
ROM- PF Right	39.56	11.37	0.04

Table 4. Mean ROMi-DF comparison with normal mean values

INCLINOMETER: One-Sample Statistics test value = 17.44			
	Mean	Std. Deviation	p
ROM - DF Left	15.92	5.52	0.14
ROM - DF Right	15.62	6.73	0.02

Table 5. Mean MMT-PF comparison with normal mean values

One-Sample Statistics test value = 51.64			
	Mean	Std. Deviation	p
MMT- PF Left	54.63	14.34	0.14
MMT- PF Right	56.24	13.58	0.04

Table 6. Mean MMT-DF comparison with normal mean values

One-Sample Statistics test value = 23.33			
	Mean	Std. Deviation	p
MMT- DF Left	22.11	12.24	0.06
MMT- DF Right	21.96	12.53	0.04

Table 7. Mean Forefoot Angle comparison with normal mean value

One-Sample Statistics test value = 8			
	Mean	Std. Deviation	p
Forefoot Angle Left	9.12	1.46	0.43
Forefoot Angle Right	8.72	1.38	0.36

Table 8. Mean Hindfoot Angle comparison with normal mean values

One-Sample Statistics test value = -5			
	Mean	Std. Deviation	p
Hindfoot Angle Left	-6.27	2.86	0.24
Hindfoot Angle Right	-6.76	3.027	0.18

degrees (using goniometer), left leg showed decreased range with mean value of 19.23±3.48 but no statistical significance with p = 0.43 whereas the ROM of right dorsiflexion was decreased with mean 18.33±2.45 which was found to be statistically significant as the p value is 0.01.

Table 3 indicates that Range of Motion of plantarflexion using goniometer in the left and the right foot. On comparing the inclinometric mean value of ROM of plantarflexion (Normal - 34.54) for left and right (Table 3), it was found that the left plantarflexion range was increased with mean 38.23±10.14 whereas right was increased with mean 39.56±11.37. The increase in left was found to be insignificant (p = 0.23) whereas the right ankle showed statistically significant increase in the plantarflexion range with p value of 0.04.

Table 4 indicates that Range of Motion of dorsiflexion using inclinometer in the left and the right foot. The inclinometric range of motion of the dorsiflexion (Table 4) when compared with the normal mean of 17.44, was found to be reduced in both the ankles with left mean of 15.92 ± 5.52 and right mean of 15.62 ± 6.73. There was no statistical significance of this reduced range of dorsiflexion (left p = 0.14, right p = 0.02).

Table 5 indicates that muscle strength of plantarflexors using hand held dynamometer in the left and the right foot. Muscle strength of plantarflexion (Table 5) was improved in left (mean 54.63±14.34) and right (mean 56.24±13.58) ankle but was statistically significant only in right (p = 0.04).

Table 6 indicates that muscle strength of dorsiflexors using hand held dynamometer in the left and the right

Table 9. Mean Navicular Drop comparison with normal mean values

One-Sample Statistics test value = 10			
	Mean	**Std. Deviation**	**p**
Navicular Drop Left	8.36	1.40	0.41
Navicular Drop Right	9.14	1.17	0.28

foot. Table 6 indicates the comparison of the normal mean value of dorsiflexor strength (23.33) in left and right foot. It shows that strength of dorsiflexors for left ankle is reduced with mean 22.11±12.24 is nearly statistically significance with p = 0.06. Similarly, in the right dorsiflexors, the muscle strength was significant decreased with mean 21.96±12.53 and p = 0.04.

Table 7 indicates that forefoot angle in the left and the right foot. Comparison of forefoot angle (Table 7) in the left and right foot showed a slight increase (normal mean 8) in the varus with left mean of 9.12±1.46 and right mean of 8.72±1.38. Both the forefoot showed insignificant increase in varus (left-p = 0.43, right- p = 0.36) statistically.

Table 8 indicates that hindfoot angle in the left and the right foot. Similar to the forefoot, hindfoot angle (Table 8) was also increased bilaterally (left- mean -6.27±2.86, right- mean -6.76±3.02) but was found to be statistically insignificant (left- p = 0.24, right- p = 0.18).

Table 9 indicates the navicular drop in the left and the right foot. The mean value of Navicular Drop (normal $\leq$ 10mm) in left foot was 8.36±1.40 and right foot was 9.14±1.17. No statistical significance (left p = 0.41, right p = 0.28) was found bilaterally.

4. Discussion

The results show that the ankle dorsiflexion ROM was reduced bilaterally but was statistically significant only in right, unlike the plantarflexion where no statistical difference was found. The muscle strength of Plantar flexion increased bilaterally but was statistically significant in right ankle only. Dorsiflexors' strength was found to be reduced bilaterally with statistically significance reflected only in the right foot. The plantarflexors were shortened more on the right ankle compared to the left in contrast to dorsiflexors which were lengthened in right and had no significant difference on the left ankle. The foot angles did not show any significant changes in bilateral foot.

Driving a cab requires an unrestricted ROM of ankle dorsiflexion and plantarflexion[20]. Park et al., in 2000, found that the drivers adjust their seat to maintain an angle of 90~110° between the calf and foot so as to move the foot from a neutral position to plantar flexion in order to use the accelerator, clutch or brakes[21]. Later in 2009, it was proved that plantarflexion happens when the foot is used to press the accelerator involving the maximum voluntary contraction range[22]. The present study shows that though there was no statistically significant change in the ROM of plantar flexion, bilaterally, there was shortening of plantar flexors in the cab drivers with prolonged driving hours or distance, which was significant in the right plantar flexors. This could be attributed to the excessive use of plantar flexors with maximum muscle contraction, for the above stated functions of the foot during driving. Due to continuous plantarflexion, the calf muscle does not get time to relax and hence goes in for shortening. This shortening of muscle was statistically significant for the right ankle when compared to the left one, due to the fact that the right foot is maintained in plantar flexion for a relatively more time to press the accelerator and brake as per the drivers' requirement in contrast to the left ankle which may get break intermittently as it is the clutch foot and is used only when gear change is needed; therefore, gets an intermittent rest. Thus, compared to the right, left foot shows less tightness of plantarflexors.

The dorsiflexors of the cab drivers shows a decrease in the range of motion but this reduction is significant only in the right foot. This finding is supported by a study, where drivers' dorsiflexion range was compared with the normal subjects and data analysis showed the reduced range of motion of the active dorsiflexion[5]. These results may be supported by the fact that the tight plantarflexors causes the reduction in the range of dorsiflexors. Since right plantarflexors are reported to be taut here, dorsiflexion can be expected to have reduced range of motion. Also, the inclinometer readings of plantarflexion range which is actually used to measure the dorsiflexion length, have increased a little though it is not statistically significant. This result is suggestive of mild lengthening of dorsiflexion, which biomechanically is expected considering the tightness of plantarflexors. Literature have established that a muscles become weak when it is maintained in a lengthened position, particularly for a long time. In a muscles' stretch weakness, the muscle is elongated beyond physiological neutral, but within the normal range of motion[5]. This explains the outcome of

weak right dorsiflexors. Also, prolonged muscle elongation has been found to cause the muscle spindle inhibition and the creation of additional sarcomeres, which shifts the length tension curve rightward[5]. On the same lines, the tightness of the right plantarflexors may be the cause of the increased muscle strength of right plantarflexors.

The foot angles i.e., the forefoot angle, hind foot angle and the navicular drop, did not show any significant changes. Though not statistically significant but results show a slight increase in varus of the forefoot angle. Research in 2022, done to study the effect of pressing the accelerator on the foot angles revealed that there was an awkward foot inversion seen in 10 male drivers[23]. This bilateral non-significant increase in varus may be due to the position of the foot. Sometimes, the drivers keep their heel supported on the surface of the car and moves only the forefoot to shift the feet inside the pedal box, hence the results.

Thus, it is safe to say that the ankle foot complex subjected to stress during prolonged driving, undergoes certain biomechanical changes which if not taken care of by the said population may portray as an ergonomical hazard thereby affecting their professional growth in long term.

There is a scope of future studies wherein researchers may take into consideration other factors that may affect the results, like the type of shoes used by the drivers and any customized seat modifications done by them.

5. Conclusion

It is inferred that the long-distance driving for a prolonged period of time affects the ankle and foot complex of a cab driver resulting in reduced dorsiflexion range of motion, increased plantarflexion tightness and reduced muscle strength of the dorsiflexors. The study demonstrated no effect of prolonged driving on the foot angles and the navicular drop.

6. References

1. Levangie PK, Norkin CC. Joint structure and function: a comprehensive analysis. FA Davis; 2011; 9:406-440.
2. Brockett CL, Chapman GJ. Biomechanics of the ankle. Orthop Trauma. 2016; 30(3):232-8. https://doi.org/10.1016/j.mporth.2016.04.015 PMid:27594929 PMCid:PMC4994968.
3. Fraser JJ, Hertel J. Joint mobility and stability strategies for the ankle. Neurology in Orthopaedics. 2019.
4. Donatelli R. Abnormal biomechanics of the foot and ankle. J Orthop Sports Phys Ther. 1987; 9(1):11-16. https://doi.org/10.2519/jospt.1987.9.1.11 PMid:18794588.
5. Kang SY, Choung SD, Jeon HS. Characteristics of leg and ankle in taxi drivers. Phys Ther Korea. 2014; 21(1):55-62. https://doi.org/10.12674/ptk.2014.21.1.055
6. Rathi A, Kumar V, Singh A, Lal P. A cross-sectional study of prevalence of depression, anxiety and stress among professional cab drivers in New Delhi. Indian J Occup Environ Med. 2019; 23(1):48-53. https://doi.org/10.4103/ijoem.IJOEM_158_18 PMid:31040590 PMCid:PMC6477938.
7. Surie A, Koduganti J. The emerging nature of work in platform economy companies in Bengaluru, India: The case of Uber and Ola Cab drivers. E-J Int Comp Labour Stud. 2016; 24:5(3).
8. Joseph L, Standen M, Paungmali A, Kuisma R, Sitilertpisan P, Pirunsan U. Prevalence of musculoskeletal pain among professional drivers: A systematic review. J Occup Health. 2020;62(1):e12150. https://doi.org/10.1002/1348-9585.12150 PMid:32810918 PMCid:PMC7434558.
9. Yasobant S, Chandran M, Reddy EM. Are bus drivers at an increased risk for developing musculoskeletal disorders. An ergonomic risk assessment study. J Ergon. 2015. https://doi.org/10.4172/2165-7556.S3-011
10. Ngatcha Tchounga CC, Azabji Kenfack M, Guessogo WR, Mekoulou Ndongo J, Bika Léle EC, Ayina Ayina CN, Temfemo A, Bongue B, Mandengue SH, Etoundi Ngoa LS, Assomo Ndemba PB. Prevalence of musculoskeletal disorders among taxi drivers in Yaoundé, Cameroon: preventive effect of physical activity. BMC Musculoskelet Disord. 2022; 23(1):1018. https://doi.org/10.1186/s12891-022-05971-w PMid:36435752 PMCid:PMC9701402.
11. Pawar P, Jadhav A, Yadav T, Bathia K. Prevalence of soft tissue dysfunctions of lower limb in cab drivers. Indian J Physiother Occup Ther. 2019; 13(3):91. https://doi.org/10.5958/0973-5674.2019.00098.4
12. Xiao S, You S, Tian T, Wu J, Zhang H. Investigation of lower limb injury under different contact stiffness for drivers during frontal crash. Acta Bioeng Biomech. 2022; 24(2):83-93. https://doi.org/10.37190/ABB-02057-2022-02
13. Hale SA, Hertel J. Reliability and sensitivity of the foot and ankle disability index in subjects with chronic ankle instability. J Athl Train. 2005; 40(1):35-40.
14. Ness BM, Sudhagoni RG, Tao H, Full OR, Seehafer LO, Walder CM, Zimney K. The reliability of a novel heel-rise test versus goniometry to assess plantarflexion range of motion. Int J Sports Phys Ther. 2018; 13(1):19. https://doi.org/10.26603/ijspt20180019 PMid:29484238 PMCid:PMC5808010.
15. Mohammad WS, Elattar FF, Elsais WM, AlDajah SO. Validity and reliability of a smartphone and digital

inclinometer in measuring the lower extremity joints range of motion. Monten. J Sports Sci Med. 2021; 10(2):47-52. https://doi.org/10.26773/mjssm.210907
16. Soucie JM, Wang C, Forsyth A, Funk S, Denny M, Roach KE, Boone D, Hemophilia Treatment Center Network. Range of motion measurements: reference values and a database for comparison studies. Haemophilia. 2011; 17(3):500-7. https://doi.org/10.1111/j.1365-2516.2010.02399.x PMid:21070485.
17. Spink MJ, Fotoohabadi MR, Menz HB. Foot and ankle strength assessment using hand-held dynamometry: reliability and age-related differences. Gerontology. 2010; 56(6):525-32. https://doi.org/10.1159/000264655 PMid:19955706.
18. Silva RS, Ferreira AL, Veronese LM, Serrao FV. Forefoot varus predicts subtalar hyperpronation in young people. J Am Podiatr Med Assoc. 2014; 104(6):594-600. https://doi.org/10.7547/8750-7315-104.6.594 PMid:25514271.
19. Jain S. Does prolonged high heeled footwear impacts foot biomechanics in fashion industry. Bull Env Pharmacol Life Sci. 2023; 12(5):178-184.
20. Jammes Y, Weber JP, Behr M. Consequences of car driving on foot and ankle mobility and reflexes. Clin Res Foot Ankle. 2017; 49:28-44. https://doi.org/10.4172/2329-910X.1000233
21. Park SJ, Kim CB, Kim CJ, Lee JW. Comfortable driving postures for Koreans. Int J Ind Ergon. 2000; 26(4):489-97. https://doi.org/10.1016/S0169-8141(00)00020-2
22. Brook S, Freeman R, Rosala G, Campean F, Dixon N. Ergonomic data measuring system for driver-pedals interaction. SAE Int J Passeng Cars Mech. Syst. 2009; 2(1):1071-8. https://doi.org/10.4271/2009-01-1164
23. Tjolleng A, Yang J, Jung K. Analysis of leg muscle activities and foot angles while pressing the accelerator pedal by different foot postures. Appl Sci. 2022; 12(24):13025. https://doi.org/10.3390/app122413025

Access this journal online	
Website: www.informaticsjournals.co.in/index.php/JEOH/index	**Quick Response Code**