

# Analyzing the Effects of Industrial Protective Glove's Material on Hand Grip Strength



Lalit Kumar Sharma, Manoj Kumar Sain, and M. L. Meena

**Abstract** Hand and forearm muscles contribute significantly in grip force execution during routine and industrial activities. Industrial gloves are used in various small-scale industries for safety purpose. However, the use of hand gloves may lead to the change in grip strength. The present study has been designed to investigate the effect of hand glove's material on hand grip strength of workers employed in various Small and Medium Enterprises (SMEs). During this study, to record the strength of workers' hand grip while performing work using different gloves, a digital hand grip dynamometer was used. Statistical test one-way ANOVA was applied to analyze the collected data. From the analysis of data, it can be concluded that there are significant differences among the grip strength means with various glove's material at the 0.05 level of significance. It is also observed that fabric gloves give best grip strength; however, there are limitations in its use.

**Keywords** ANOVA · Gloves · Hand grip strength · Muscles

## 1 Introduction

India has many small and medium enterprises (SMEs) where the labor do hand work. The labor associated with such enterprise is victim of various musculoskeletal disorders. Researchers identified that ergonomics intervention are not applied widely in SMEs and suggested that with appropriate anthropometric data, designers can design proper equipment and tools for the workers. With the improvements in currently adopted procedures, the quality of manual operations can be improved [1–3]. Grip strength is a major attribute of various operational activities in everyday working

---

L. K. Sharma (✉) · M. L. Meena  
Malaviya National Institute of Technology, Jaipur, Rajasthan 302017, India

M. L. Meena  
e-mail: [mlmeena.mech@mnit.ac.in](mailto:mlmeena.mech@mnit.ac.in)

M. K. Sain  
Swami Keshvanand Institute of Technology, Management and Gramothan, Jaipur, Rajasthan 302017, India