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Kukic, Filip; Cvorovic, Aleksandar ; Dawes, James; Orr, Rob Marc; Dopsaj, Milivoj

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DOES BMI NEGATIVELY IMPACT PERFORMANCE IN LOCAL MUSCULAR ENDURANCE, SPRINT PERFORMANCE AND METABOLIC POWER IN POLICE



Filip Kukic, Aleksandar Cvorovic
Abu Dhabi Police



Jay Dawes
Health Department



Robin Orr
Tactical Research Unit



Milivoj Dopsaj
Analysis and Diagnosis Department

PURPOSE: Body mass index (BMI) is an anthropometric measure used to assess body mass in relation to height. Studies on police officers (PO) have shown associations between BMI and physical performance, injury rate and health. Thus, the purpose of this study was to investigate if an increased BMI influenced a PO's basic physical abilities, and if so, what the nature of the influence was.

METHODS: A cross-sectional study design was used. The sample included 284 participants divided in three groups relative to BMI: Normal – BMI≤24.9, Overweight – BMI=25-29.9 and Obese – BMI≥30. The main characteristics were: Normal (n=66, age=31.79±3.35yrs, Body Mass (BM)=71.03±6.92 kg, Body Height (BH)=174.08±6.52 cm); Overweight (n=132, age=31.99±4.13yrs, BM=82.58±7.45 kg BH=173.77±6.00 cm); Obese (n=86, age=31.59±4.13yrs, BM=100.44±13.27 kg, BH=173.33±7.24 cm). Sprinting speed, local muscular endurance and metabolic power were tested using a test battery consisting of a 50m sprint (50m), 1-minute Push-ups (PU), and Sit-ups (SU) and an 800m run (800m). Analysis of variance (one-way ANOVA) with Bonferroni post-hoc analysis was used to investigate the differences between the groups in physical abilities, with the significance level set at $p<0.05$.

RESULTS: Normal and Overweight groups were significantly better than the Obese group in 50m (-0.99 sec, $p<0.001$, and -0.64 sec, $p<0.001$, respectively), PU (10.57 reps, $p<0.001$, and 7.65 reps, $p<0.001$, respectively), SU (8.85 reps, $p<0.001$, and 6.52 reps, $p<0.001$, respectively), and 800m (-75.99 sec, $p<0.001$, and -55.46 sec, $p<0.001$, respectively). Although Bonferroni analysis did not show significant differences between the Normal and Overweight groups, the trends of the average changes suggest that differences exist between these two groups as well.

CONCLUSION: Increased BMI negatively affected running performance and local muscular endurance in PO. The results suggest that BMI standards might be a helpful non-invasive, inexpensive, quick screening and follow-up tool for PO's physical performance.

PURPOSE

To investigate if an increased BMI influenced a PO's basic physical abilities, and if so, what the nature of the influence was



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INTRODUCTION

- Police officers duties can include service in: general policing, riot squads, emergency response police, counter-terrorist units, traffic patrol units, assets protection, and custodial officers.
- Tasks performed during these duties may involve chasing suspects on foot, grappling, wrestling and fighting with uncooperative belligerents, carrying injured or unconscious people, and manual handling tasks.
- Studies on police officers (PO) have shown associations between BMI and physical performance, injury rate and health.

METHODS

Anthropometric and physical abilities data for 284 Police Officers were collected and divided in three groups relative to BMI:

Normal – BMI≤24.9, Overweight – BMI=25-29.9 and Obese – BMI≥30.

The main characteristics were:

Normal (n=66, age=31.79±3.35yrs, Body Mass (BM)=71.03±6.92 kg, Body Height (BH)=174.08±6.52 cm); **Overweight** (n=132, age=31.99±4.13yrs, BM=82.58±7.45 kg BH=173.77±6.00 cm);

Obese (n=86, age=31.59±4.13yrs, BM=100.44±13.27 kg, BH=173.33±7.24 cm).

Physical abilities were tested using a test battery consisting of the following.

Sprinting speed – 50m sprint (50m)

Local muscular endurance – 1-minute Push-ups (PU) and Sit-ups (SU)

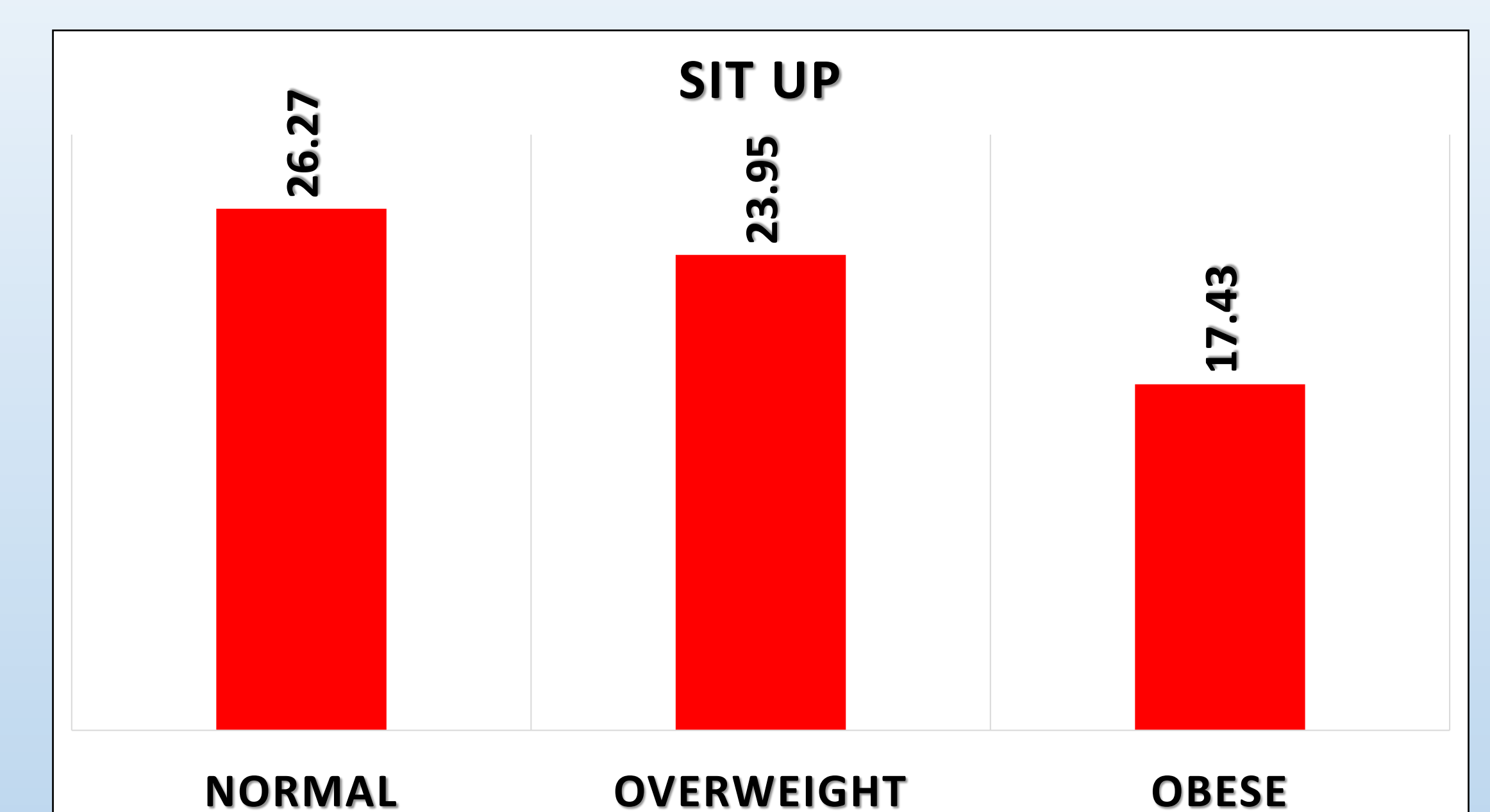
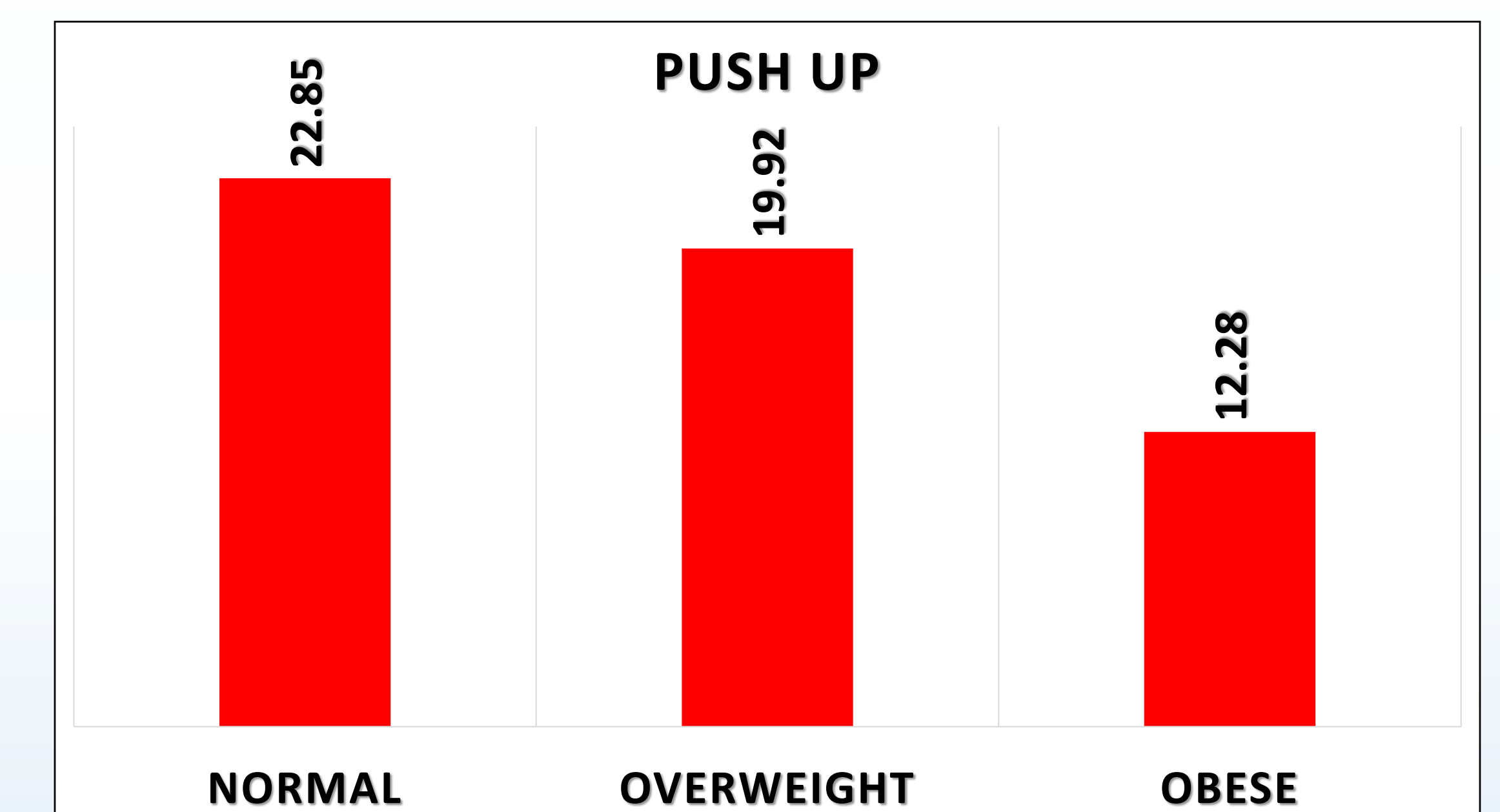
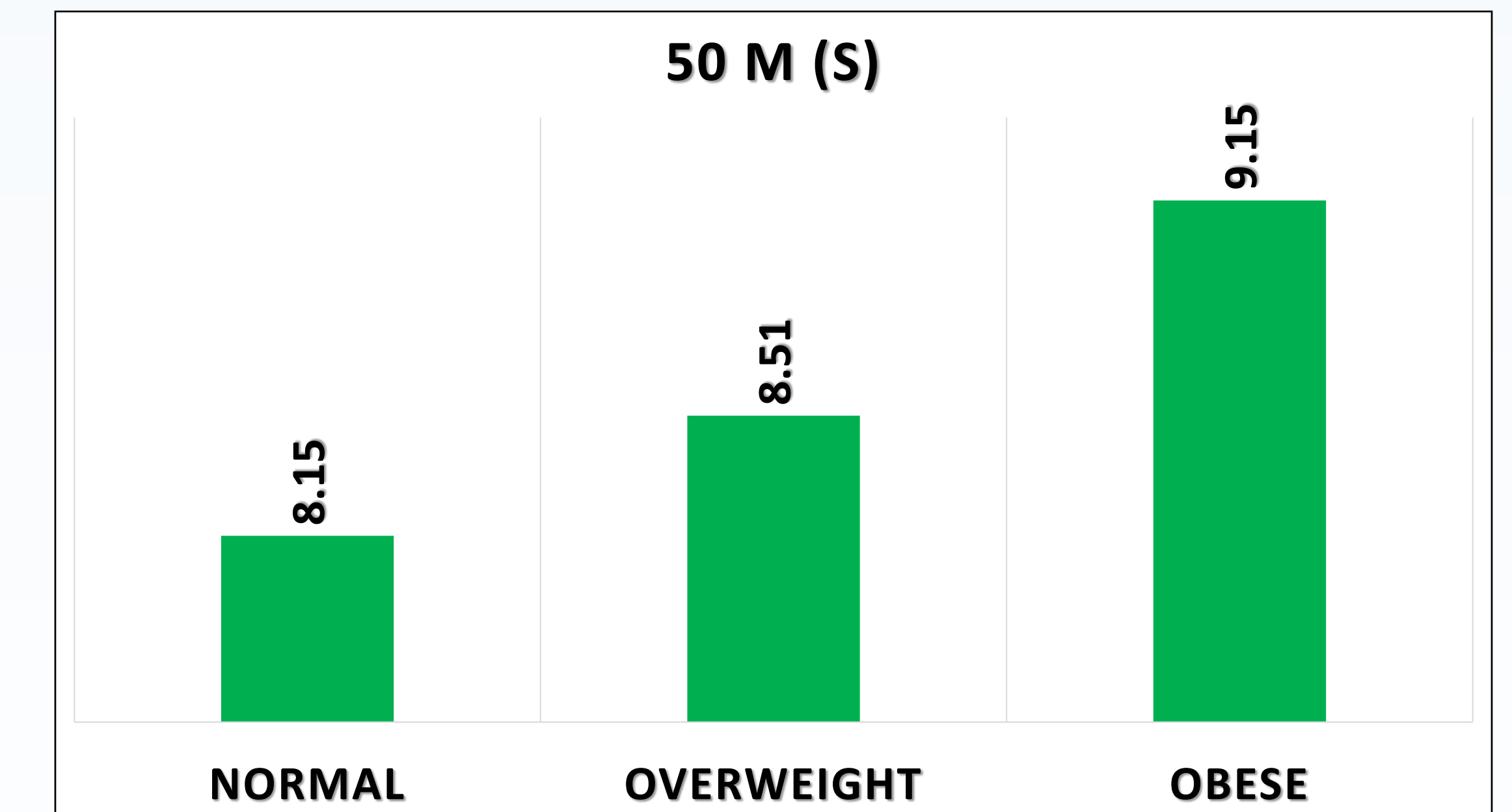
Metabolic power – 800m run (800m).

Analysis of variance (**one-way ANOVA**) with **Bonferroni post-hoc** analysis was used to investigate the differences between the groups in physical abilities, with the significance level set at $p<0.05$.

CONCLUSION

- **Obese PO perform lower than Normal and Overweight officers in sprinting performance, PU, SU, and metabolic power.**
- **Since obesity lowers the physical performance of PO and has been associated with reduced health status and increases in risk of injuries in other research, BMI standards might be a helpful non-invasive, inexpensive, quick screening and follow-up tool for PO's physical performance.**

RESULTS



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