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Comparison Between Types of Shoes on Balance Among Recreational Netball Players

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I. INTRODUCTION

Balance is a fundamental requirement in netball, a sport characterised by rapid directional changes, jumping, landing, and sudden stops. Maintaining postural stability during these high-demand movements is critical for both performance enhancement and injury prevention [1]. Despite its popularity among young women in Malaysia and the wider Commonwealth, recreational netball players are rarely advised on appropriate footwear selection and often prioritise comfort, cost, or aesthetics over biomechanical suitability [2].

Footwear design plays a significant role in modulating balance by affecting cushioning, heel height, lateral support, and proprioceptive feedback [3][4]. Running shoes are primarily engineered for forward locomotion and shock absorption, whereas netball shoes are designed for multidirectional movement with superior lateral stability, forefoot support, and traction. Surface compliance is another critical factor, as unstable surfaces such as foam pads reduce proprioceptive input, thereby increasing postural demand and impairing balance performance [3].

Although several studies have examined footwear effects on balance across different sports [3][5], research specifically addressing recreational female netball players remains limited. Most existing literature focuses on elite athletes or male-dominated sports, making direct comparisons to recreational female netballers problematic [2]. This study therefore aimed to determine whether shoe type (running vs. netball) affects balance performance, and to determine whether surface type (firm vs. foam) affects balance performance among recreational female netball players.

II. METHODS

This study employed a quasi-experimental research design. Purposive sampling was used to recruit 20 female recreational netball players aged 18–30 years ($M \pm SD$: 23.00 $\pm$ 1.30 years) from two locations: Universiti Teknologi MARA (UiTM) Kampus Seremban and a community netball court in Felda Tenang. Inclusion criteria required participants to be active recreational netball players (minimum once per week) with no recent lower-limb injuries,

musculoskeletal conditions, or medication use that could affect balance. A G*Power analysis based on an effect size of Cohen's $d = 0.55$ at $\alpha = 0.05$ confirmed the adequacy of $n = 20$. Participants were divided into two groups of ten: the running shoe group (Adidas Galaxy 6) and the netball shoe group (Asics Netburner Professional). Balance was assessed using the Balance Error Scoring System (BESS), which evaluates static postural stability through six conditions combining three stances (double-leg, single-leg, and tandem) on two surface types (firm and foam). Errors, including eye opening, stepping, falling, and lifting the hands from the hips, were counted over a 20-second trial per condition, with a maximum of 10 errors per condition. Higher BESS error scores indicate poorer balance performance.

Data normality was confirmed using the Shapiro-Wilk test (firm = $p > .059$, foam = $p > .614$), and homogeneity of variance was verified using Levene's test (firm = $p > .308$; foam = $p > .353$). An independent samples t-test compared BESS scores between shoe groups on each surface, while paired samples t-tests compared firm versus foam performance within each shoe group. All analyses were conducted in SPSS and Jamovi at $\alpha = 0.05$.

III. RESULTS AND DISCUSSION

A summary of the results is presented in Table 1. The independent samples t-tests revealed no significant difference in balance performance between running shoes ($M \pm SD = 3.20 \pm 2.94$) and netball shoes ($M \pm SD = 3.10 \pm 2.18$) on the firm surface, $t(18) = 0.086$, $p = .932$. Similarly, no significant difference was found on the foam surface between running shoes ($M \pm SD = 8.00 \pm 2.54$) and netball shoes ($M \pm SD = 7.20 \pm 2.74$), $t(18) = 0.677$, $p = .507$. These results indicate that shoe type did not significantly affect static balance performance in recreational netball players, regardless of surface condition.

These findings align with research suggesting that the functional advantages of sport-specific footwear may be more pronounced during dynamic, sport-specific tasks, such as cutting, landing, and pivoting, than during static balance assessments [1]. Furthermore, recreational players may not possess

the advanced neuromuscular control required to capitalise on the biomechanical differences between shoe types [6]. It is also recognised that modern running and netball shoes both provide sufficient cushioning and structural support for fundamental balance tasks, thereby reducing between-shoe differences in static conditions [3][5].

In contrast, surface type demonstrated a highly significant effect on balance performance. Paired samples t-tests showed that both the running shoe group (firm: $M = 3.20$, foam: $M = 8.00$, $p < .001$) and the netball shoe group (firm: $M = 3.20$, foam: $M = 7.20$, $p < .001$) committed significantly more errors on the foam surface. These results are consistent with established evidence that unstable surfaces impair somatosensory input, thereby increasing neuromuscular demand and postural sway [3][4].

TABLE 1
BESS ERROR SCORE BY SHOES AND SURFACE TYPES

Condition	Shoe Type	Mean $\pm$ SD	p-value
Firm Surface	Running Shoes	3.20 $\pm$ 2.94	.932
	Netball Shoes	3.10 $\pm$ 2.18	
Foam Surface	Running Shoes	8.00 $\pm$ 2.54	.507
	Netball Shoes	7.20 $\pm$ 2.74	
Firm vs. Foam (Running)	Running Shoes	3.20 vs. 8.00	< .001*
Firm vs. Foam (Netball)	Netball Shoes	3.20 vs. 7.20	< .001*

*Significant level, $p < .05$

The results support previous findings that unstable surfaces increase postural demand due to reduced somatosensory feedback [3]. From a practical perspective, this suggests that coaches should focus more on balance training on unstable surfaces than on relying solely on footwear selection. Progressive unstable surface training, such as foam pads or balance discs, may help improve balance performance [3][4].

IV. CONCLUSIONS

This study found no significant difference in static balance performance between running shoes and netball shoes among recreational netball players. However, surface type significantly affected balance performance, with foam surfaces resulting in poorer stability. These findings indicate that surface compliance plays a more important role than shoe type in influencing static postural stability in this population. Coaches and practitioners are encouraged to include progressive unstable surface training in their programmes to enhance balance and reduce injury risk [3][4]. Future research should include larger sample sizes and dynamic balance assessments to further understand the influence of footwear and surface type in netball performance.

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REFERENCES

- [1] Sinclair, J., Chockalingam, N., Naemi, R., & Vincent, H. (2014). The effects of sport-specific and minimalist footwear on the kinetics and kinematics of three netball-specific movements. *Footwear Science*, 7(1), 31–36.
- [2] Kirk, M. M., Mattock, J. P. M., Colman, C. E., Hides, J. A., & Peeling, P. (2022). Do the footwear profiles and foot-related problems reported by netball players differ between males and females? *Sports Medicine Open*, 8(1), 103.
- [3] Karasawa, S., Yamamoto, M., Sakurai, J., Kawasaki, S., & Kobayashi, H. (2022). The impact of footwear on posture, gait and balance. *Health*, 14(2), 209–218.
- [4] Menant, J. C., Perry, S. D., Steele, J. R., Menz, H. B., Munro, B. J., & Lord, S. R. (2008). Effects of shoe characteristics on dynamic stability when walking on even and uneven surfaces in young and older people. *Archives of Physical Medicine and Rehabilitation*, 89(10), 1970–1976.
- [5] Notarnicola, A., Maccagnano, G., Pesce, V., Tafuri, S., Mercadante, M., Fiore, A., & Moretti, B. (2015). Effect of different types of shoes on balance among soccer players. *Muscles, Ligaments and Tendons Journal*, 5(3), 208–213.
- [6] Mohamed, M. K., Taha, R. A., Baig, H. T., Heji, H. G., Aryan, N. O., Ramakrishnan, S., & Mysore, S. B. (2020). Effect of footwear on balance and gait among young female students. *Journal of Orthopaedics and Sports Medicine*, 3(1), 7–13.