The effect of good and poor walking shoe characteristics on plantar pressure and gait in people with gout
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Background
People with gout often present with poor footwear. Poor footwear is associated with higher levels of foot pain, impairment and disability in people with gout. Previous research has found that good footwear characteristics may reduce foot pain and disability in people with gout. However, there is limited evidence on the impact of footwear characteristics on foot function in people with gout. The aim was to explore the effect of good and poor footwear characteristics on plantar pressure and temporal spatial parameters of gait in people with gout.

Methods
A cross-sectional repeated measures study design was employed. Thirty-six participants were recruited from rheumatology clinics based in Auckland District Health Board and Counties Manukau District Health Board. Plantar pressure and temporal spatial parameters were recorded in two shoe conditions: (1) the participants own footwear, and (2) either a new pair of walking shoes with good footwear characteristics (n = 21) or poor characteristics (n = 15).

Results
Compared to participant’s own shoes, footwear with good characteristics significantly reduced peak pressure at 3rd (p = 0.003) and 5th metatarsals (p = 0.001), reduced pressure time integrals beneath the heel (p = 0.000) and metatarsals 3 (p = 0.000) and 5 (p = 0.0048) and increased pressure time integrals beneath the midfoot (p = 0.000). The footwear with poor characteristics significantly increased peak pressure beneath the heel (p = 0.000) and lesser toes (p = 0.003), reduced peak pressure at metatarsal 3 (p = 0.004) and reduced pressure time integrals in the midfoot (p = 0.003) compared to participants own shoes. Both good and poor footwear significantly increased walking velocity (p = 0.000), step length (p = 0.000), and stride length (p = 0.000) compared to participants own shoes.

Conclusions
Walking shoes with good footwear characteristics can influence plantar pressure values and may encourage a more efficient heel to toe gait pattern in people with gout. These changes may contribute to the reduction in foot pain and foot-related problems in this population. Future work is determining the long term effects of footwear on foot pain and foot-related disability in people with gout.