

## Footwear recommendations for Runners: Influencing factors and professional perspectives

Aaron Jackson<sup>a,b,\*</sup> , Kelly Sheerin<sup>b</sup> , Mike Frecklington<sup>a,c</sup>, Matthew R. Carroll<sup>a,c</sup>

<sup>a</sup> School of Allied Health, Faculty of Health & Environmental Sciences, Auckland University of Technology, Private Bag 92006, Auckland, 1142, New Zealand

<sup>b</sup> Sports Performance Research Institute New Zealand (SPRINZ), Faculty of Health & Environmental Sciences, Auckland University of Technology, Private Bag 92006, Auckland, 1142, New Zealand

<sup>c</sup> Active Living and Rehabilitation: Aotearoa New Zealand, Health and Rehabilitation Research Institute, School of Allied Health, Auckland University of Technology, Auckland, New Zealand

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### ABSTRACT

**Objective:** Runners value footwear advice provided by experts. It is therefore essential to understand the nature of these recommendations. This study identified factors influencing individualised running footwear recommendations and measured the relative importance placed on footwear characteristics related to comfort and injury management.

**Design:** Cross-sectional survey.

**Setting:** Online.

**Participants:** Podiatrists, physiotherapists, running coaches, and footwear retailers working in New Zealand.

**Main outcome measures:** Quantitative survey questions covering footwear recommendation habits, and beliefs regarding the functional capacity of running footwear.

**Results:** A total of 264 responses were received. Most participants identified comfort (96 %) and injury prevention (86 %) as important considerations in footwear selection. Retailers were more likely than other groups to emphasise the importance of arch height and foot motion ( $p < 0.001$ ). Cushioning was rated the most influential characteristic for both comfort (99 %) and injury management (94 %). Most participants (91 %) thought medial posting influenced injury management, whilst shoe/upper width (95 %) and forefoot stiffness (93 %) were frequently linked to comfort. Significant differences emerged regarding beliefs about footwear functionality: 82 % of retailers believed that footwear could reduce pronation, compared to 55 % of podiatrists, 42 % of physiotherapists, and 29 % of coaches ( $p < 0.001$ ).

**Conclusions:** Podiatrists and retailers provide individualised footwear advice more frequently and confidently and are more likely to base their recommendations on reducing pronation than physiotherapists and coaches.

### 1. Background

Running is a popular activity with well-established physical and mental health benefits (Oja et al., 2015; Oswald et al., 2020). In Aotearoa/New Zealand (NZ) and similarly in other Western nations, approximately one in five adults run regularly (Brocklesby, 2019; Clemence, 2021). For many runners, the simplicity of running is appealing, with most considering footwear to be the most important piece of equipment required to partake (Malisoux & Theisen, 2020; Ramsey et al., 2022). When purchasing footwear, runners tend to look for shoes that they perceive to reduce their risk of injury or improve their

performance (Agresta et al., 2022; Malisoux & Theisen, 2020; Ramsey et al., 2022). Despite an increase in research on running footwear over recent decades, there is still no consensus on how to determine an individual's optimal shoe for injury prevention (Agresta et al., 2022; Malisoux & Theisen, 2020; Nigg et al., 2023; Richards et al., 2009).

The desire to find shoes that protect runners from injury is not new, and several paradigms have been proposed over the years (Hamill & Bates, 2023; Nigg et al., 2023). During the late 1960's and early 1970's the number and diversity of runners increased rapidly, and with it, the incidence of running-related injuries (RRI) (Powell et al., 1986). Historical prevalence studies often cited overpronation as an important

\* Corresponding author. School of Allied Health, Faculty of Health & Environmental Sciences, Auckland University of Technology, Private Bag 92006, Auckland, 1142, New Zealand.

E-mail address: [aaron.jackson@aut.ac.nz](mailto:aaron.jackson@aut.ac.nz) (A. Jackson).

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causative factor for RRI (Clement et al., 1981; Hamill & Bates, 2023; Powell et al., 1986). Due to these observations, overpronation received considerable attention and has arguably had the most significant influence on footwear design to date (Hamill & Bates, 2023). Vertical ground reaction forces during running have also been linked to the development of RRI, leading manufacturers to manipulate the hardness and thickness of the midsole in an attempt to reduce this risk (Agrega et al., 2022; Hamill & Bates, 2023). Nigg et al. (2015) proposed the closely related, theoretical concepts of the preferred movement path and comfort filter, which spurred an increase in attention paid to the association between comfort and RRI. Although not yet substantiated by empirical evidence, these concepts focused on the nuanced responses of individuals to running footwear. Firstly, Nigg et al. (2015) suggested that a runner moves along a ‘preferred movement pathway’ which is somewhat fixed, and the ideal shoe should allow the runner to follow this path. Moreover, comfort is a subjective experience for each runner, and footwear that feels more comfortable is often associated with being more protective (Nigg et al., 2015).

These divergent paradigms, and the complex interaction of running biomechanics and RRI, ensure that this is a challenging area of practice for anyone seeking to provide individualised footwear advice. Evidence regarding the accuracy and effectiveness of personalised recommendations suggests that reducing RRI through individualised footwear advice is not possible (Knapik et al., 2009; Malisoux & Theisen, 2020; Schweltnus & Stubbs, 2006). Personalised footwear recommendations that effectively reduce RRI are reliant on two fundamental premises: 1) the person making the recommendation has an accurate understanding of the modifiable biomechanical factors that increase that individual’s risk of injury, and 2) that a single, selectable footwear characteristic can positively modify the identified risk factor more effectively than another. Mai et al. (2023) suggested that footwear may influence the biomechanical risk factors associated with RRI, some positively and others adversely, depending on the specific injury. Therefore, it is the responsibility of the experts providing this advice to consider individual and injury-specific needs before making recommendations (Mai et al., 2023).

Despite ongoing debate surrounding footwear advice, runners typically value recommendations from retailers, healthcare providers, and coaches (Dhillon et al., 2020; Fife et al., 2023, 2024). These experts regularly provide guidance, yet there is limited empirical evidence to support their recommendations. Given the influence such advice has on runners’ footwear choices, it is critical to understand how these recommendations are formed, particularly in the absence of evidence-based guidelines. While previous research has examined factors influencing runners’ own footwear selection, little is known about the decision making process of those providing expert advice (Andrade & Santos, 2022; Fife et al., 2023; Nguyen et al., 2022; Ramsey et al., 2022). Only two studies have investigated the perceptions of individuals who recommend running footwear (Fife et al., 2024; Woltho et al., 2020). Woltho et al. (2020) compared the views of running shoe salespeople and physiotherapy students in Sweden and found that both groups were confident that appropriate advice could reduce RRI risk. While this work provides some insight, the survey focused on foot pronation and its perceived relationship with RRI, without exploring views related to other footwear considerations. Fife et al. (2024) found that footwear salespeople often provided recommendations lacking empirical support and overestimated their influence on runners’ decisions. These findings highlight a critical gap: we do not yet understand what constitutes an individualised footwear recommendation, nor the factors that shape expert advice. Addressing this gap is essential to inform future research and ultimately improve the validity and effectiveness of expert guidance.

This study had three aims: first, to identify the factors influencing individualised footwear recommendations; second, to measure the importance placed on key shoe characteristics in relation to comfort and injury management; and third, to compare perspectives between

podiatrists, physiotherapists, retailers, and running coaches on the function and role of running footwear.

## 2. Methods

### 2.1. Study design

This study utilised a cross-sectional online survey. Data were anonymously collected using an open online survey platform (Qualtrics XM, Provo, UT). Survey responses were collected from the August 21, 2023 to the October 22, 2023. Data were reported using the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) (Appendix 1) (Eysenbach, 2004).

### 2.2. Participants

Participants were drawn from the following four groups: podiatrists, physiotherapists, specialist footwear retailers (key retail chains that offer individual advice to runners, herein referred to as retailers), and running coaches (coaches were self-identified and did not require formal qualification or training to participate). Clinicians (podiatrists and physiotherapists) were required to hold an annual practising certificate. To be included in the study, participants had to be working in NZ.

### 2.3. Survey

The survey was developed through an iterative process. The questions were initially developed by the research team, which has extensive experience in footwear science and research, clinical practice (both podiatry and physiotherapy), footwear retail, and running. The draft survey was piloted by one physiotherapist, two podiatrists (one clinical and one academic), and one footwear retailer, each with over 16 years of experience. The pilot group completed the survey and provided feedback before meeting in an online focus group format to discuss and finalise the survey questions. AJ, who has experience in survey development, facilitated this focus group.

The final survey (Appendix 2) consisted of 34 questions, although no single respondent was presented with more than 22 questions. The questions were divided into three sections, the first asked for demographic information such as role, age, experience and demographic region. Additionally, this section contained several questions about the typical athlete profile for coaches or the retailer’s professional experience. The second section recorded how often participants made individual recommendations for running footwear and measured the respondents’ footwear recommendation habits. This included their beliefs about what running shoes were capable of, how often they discussed key shoe characteristics, and what they thought influenced these recommendations. The third section asked role-specific questions about how participants stayed current with new information and explored their preferences or actions related to footwear referrals. Survey questions were a combination of categorical multiple-choice questions [3–17, 28–30, 33 and 34], Likert scales [18–25 and 27], and percentage sliders [26 and 35]. The order of choices for each question was presented in a different, random order for each participant, and participants were able to go back at any stage until the response was submitted.

### 2.4. Data collection

Multiple strategies were used to recruit, including social media, advertising at two NZ conferences and emails to key contacts within the industry. Convenience sampling was used, and participants were incentivised through five \$100 grocery vouchers. Participants who opted to enter the prize draw made this selection at the end of the survey and were taken to another survey to maintain anonymity. Consent was obtained through potential participants answering a yes or no question on the survey landing page. If individuals did not consent to participate,

they could not proceed to the survey questions. Ethical approval was obtained from the institutional ethics committee [AUTECH #23/93].

### 3. Data analysis

All categorical data is described as a number (n) and a percentage (%). The Likert scale data is presented as the number and percentage of respondents who selected each category. Percentage sliders are reported as mean (out of 100) and standard deviation (SD). The differences in how podiatrists, physiotherapists, retailers, and coaches responded to questions 18 to 25 were analysed using the Fisher-Freeman-Halton exact test with significance set at  $p < 0.05$ .

## 4. Results

### 4.1. Participant characteristics

A total of 264 survey responses were collected. These included 88 podiatrists (33 %), 39 physiotherapists (15 %), 116 retailers (44 %) and 21 running coaches (8 %). An additional eight responses were received from participants who provided consent but did not answer any further questions; these were not included in the analysis. The characteristics of the participants are shown in Table 1.

### 4.2. Footwear recommendation practices

Retailers were the most confident of the four groups in recommending running footwear, with 87 % ( $n = 92$ ) reporting high or very high confidence (Fig. 1). A comparative 56 % ( $n = 40$ ) of podiatrists were equally confident, as were 46 % of physiotherapists ( $n = 12$ ) and coaches ( $n = 6$ ). Nineteen percent of physiotherapists ( $n = 5$ ) and 31 % ( $n = 4$ ) of coaches, respectively, stated their confidence was either low or very low.

Podiatrists frequently made footwear recommendations: 50 % ( $n = 42$ ) did so 1–10 times per week, 30 % ( $n = 25$ ) made 11–20 recommendations, and 15 % ( $n = 13$ ) made more than 21. Only 5 % ( $n = 4$ ) did not provide recommendations. Physiotherapists were less active, with 76 % ( $n = 29$ ) making fewer than 10 recommendations weekly and 21 % ( $n = 8$ ) not providing any. Most retailers (74 %,  $n = 84$ ) always gave individual recommendations, while 65 % of coaches ( $n = 13$ ) did so occasionally and 15 % ( $n = 3$ ) never did.

Cushioning, shoe/upper width, and medial posting were the most discussed footwear characteristics (Fig. 2), with 85 % ( $n = 177$ ), 81 % ( $n = 169$ ), and 72 % ( $n = 150$ ) of respondents discussing each variable ‘frequently’ or ‘always’. Conversely, the least discussed characteristics

were minimalism and carbon plates, which were only discussed ‘frequently’ or ‘always’ by 12 % ( $n = 26$ ) and 17 % ( $n = 36$ ) of survey participants, respectively.

### 4.3. Foot assessment

Significant differences between groups were found in the perceived importance of foot motion and arch height (both  $p < 0.001$ ). Retailers placed the highest importance on these characteristics, with 86 %, ( $n = 90$ ) rating foot motion as ‘extremely important’, compared to 55 % ( $n = 52$ ) of clinicians and just 15 % ( $n = 2$ ) of coaches. Similarly, 56 % ( $n = 59$ ) of retailers considered arch height ‘extremely important’, versus 30 % of clinicians ( $n = 29$ ) and 21 % ( $n = 3$ ) of coaches.

### 4.4. Pronation

Retailers demonstrated a significantly greater propensity than other professional groups to discuss medial posting ( $p < 0.001$ ) and to endorse the belief that footwear can mitigate pronation ( $p < 0.001$ ). Both podiatrists and retailers were significantly more likely ( $p < 0.001$ ) to recommend footwear with the primary purpose of reducing pronation. Among retailers, 82 % ( $n = 84$ ) expressed the belief that footwear could effectively reduce pronation. In contrast, physiotherapists exhibited greater uncertainty regarding this claim; 46 % ( $n = 11$ ) reported being unsure, while 12 % ( $n = 3$ ) explicitly stated that pronation control through footwear was not achievable. Responses among podiatrists were more heterogeneous: 55 % ( $n = 35$ ) agreed that footwear could reduce pronation, 28 % ( $n = 18$ ) were uncertain, and 17 % ( $n = 11$ ) disagreed. When considering pronation control as a primary factor influencing footwear recommendations, 89 % of retailers ( $n = 93$ ), 57 % of podiatrists ( $n = 36$ ), 45 % of physiotherapists ( $n = 11$ ), and 7 % of coaches ( $n = 1$ ) identified it as a key objective.

### 4.5. Comfort

Comfort was identified as the most critical factor in selecting running footwear. The majority of respondents (93 %,  $n = 200$ ) rated comfort as ‘extremely important’. Significant intergroup differences were observed ( $p < 0.001$ ), with physiotherapists less likely (77 %) than other groups (95 %) to prioritise comfort to the same extent. Key footwear characteristics perceived to influence comfort included cushioning (99 %,  $n = 207$ ), shoe/upper width (95 %,  $n = 202$ ), forefoot stiffness (93 %,  $n = 202$ ), and upper material/construction (92 %,  $n = 200$ ).

**Table 1**  
Demographic details of study participants.

	Podiatrist	Physiotherapist	Footwear Retailer	Running Coach	All
Number	88	39	116	21	264
Experience (years (SD))	15.0 (10.6)	15.0 (9.5)	5.5 (8.2)	15.1 (12.4)	10.9 (10.7)
<b>Highest Education, n (%)</b>					
High School	0	0	59 (55)	1 (5)	60 (24)
Diploma/Certification	0	0	15 (14)	7 (36)	22 (9)
Bachelors Degree	52 (60)	19 (50)	24 (22)	6 (31)	101 (40)
Post-graduate qualification	27 (31)	9 (24)	4 (4)	3 (16)	43 (17)
Masters Degree	7 (8)	9 (24)	5 (5)	2 (11)	23 (9)
Doctoral Degree	0	1 (3)	0	0	1 (0)
<b>Age, n (%)</b>					
Under 20	0	0	28 (25)	0	28 (11)
20–29	21 (24)	12 (32)	39 (34)	1 (5)	73 (28)
30–39	27 (31)	9 (24)	14 (12)	2 (11)	52 (20)
40–49	23 (27)	10 (26)	13 (11)	5 (26)	51 (20)
50–59	12 (14)	6 (16)	13 (11)	6 (32)	37 (14)
60+	3 (3)	1 (3)	7 (6)	5 (26)	16 (6)
<b>Geographic Region, n (%)</b>					
North Island	64 (74)	32 (84)	84 (74)	14 (74)	194 (75)
South Island	22 (26)	6 (16)	30 (26)	5 (26)	63 (25)

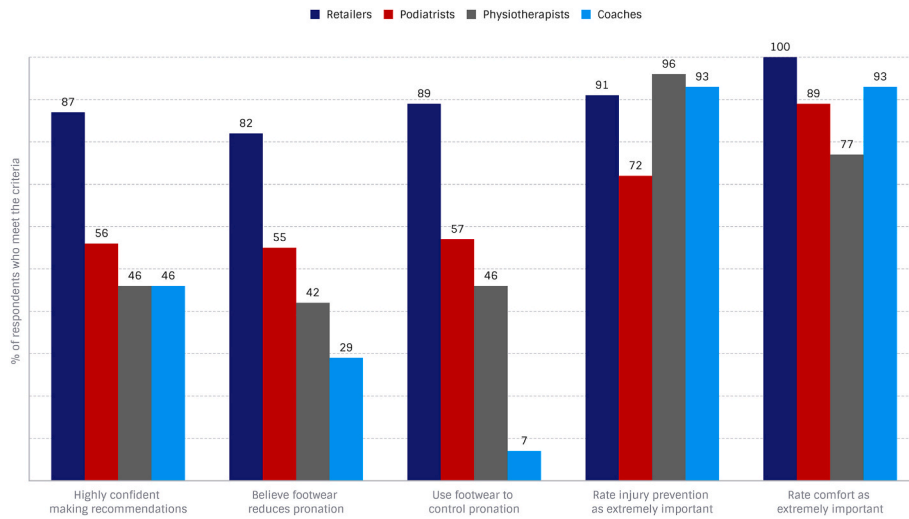


Fig. 1. Professional group comparison on footwear recommendation practices.

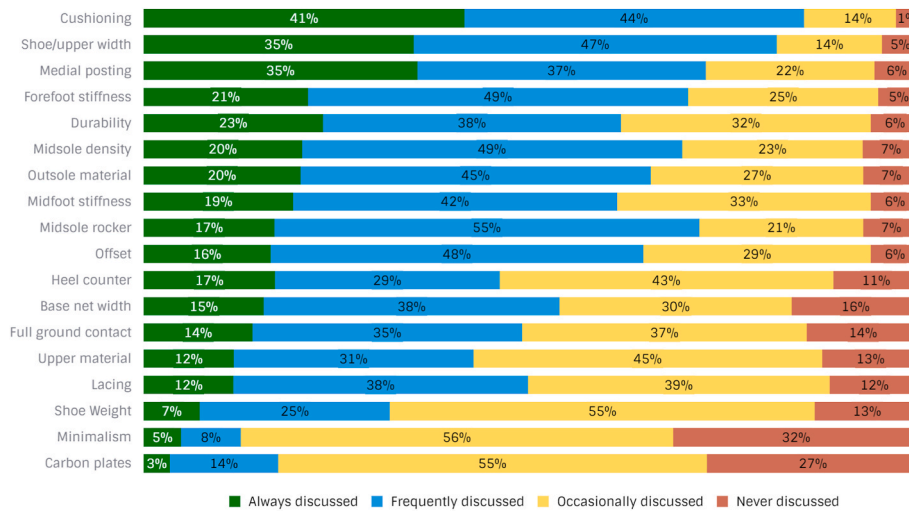


Fig. 2. Frequency of discussion regarding footwear characteristics.

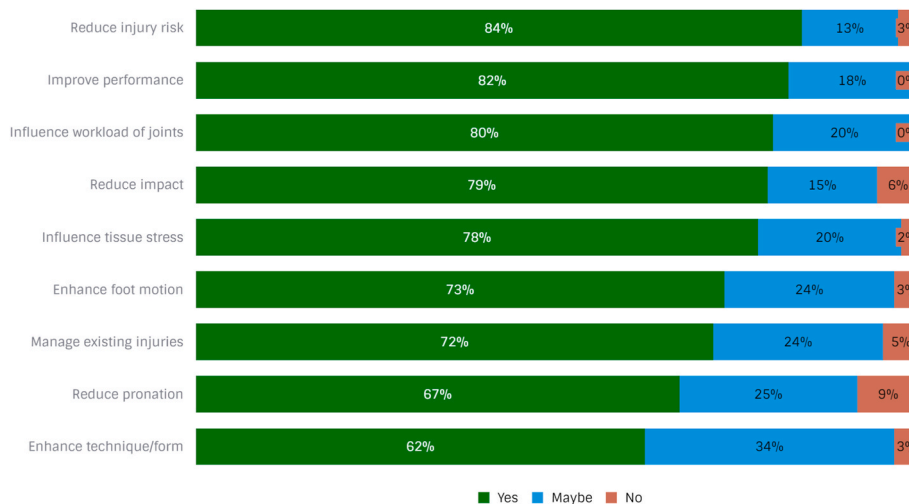


Fig. 3. Participants' beliefs surrounding footwear function.

#### 4.6. Injury

Injury prevention and management were rated as ‘extremely important’ by 86 % of respondents ( $n = 185$ ), though significant intergroup differences were observed ( $p < 0.001$ ). Podiatrists were less likely (72 %) than other groups (average 93 %) to prioritise this factor. When assessing runners, current and past injuries were considered ‘extremely important’ by 87 % ( $n = 187$ ) and 71 % ( $n = 152$ ) of participants, respectively.

The majority (84 %,  $n = 170$ ) agreed that properly fitted footwear could reduce the risk of injury (Fig. 3). Injury prevention and management were the most common reasons for footwear recommendations, with 86 % ( $n = 176$ ) and 81 % ( $n = 166$ ) of respondents, respectively, reporting these considerations were ‘often’ or ‘always’ prioritised. Cushioning and medial posting were the footwear characteristics most frequently associated with reducing the risk of RRI. These characteristics were considered effective ‘sometimes’ or ‘in most cases’ by 95 % ( $n = 197$ ) and 91 % ( $n = 190$ ) of respondents, respectively.

### 5. Discussion

The present study investigated the factors influencing footwear recommendations provided to runners by podiatrists, physiotherapists, footwear retailers, and running coaches. Furthermore, it assessed the relative importance attributed to specific footwear characteristics in relation to comfort and injury management, while measuring intergroup differences among the four cohorts. The priorities of these experts in this study align with what runners look for when choosing footwear, that being, comfortable footwear that reduces the risk of injury and optimises running biomechanics (Fife et al., 2023; Ramsey et al., 2022). Several differences were observed when contrasting the responses of podiatrists, physiotherapists, retailers, and coaches. The most significant of these related to views and behaviours surrounding medial posting and pronation control.

Aligned with previous evidence, the survey data indicated that when making recommendations for running footwear, comfort is an important consideration (Fife et al., 2023; Nguyen et al., 2022). However, one challenge when attempting to prescribe a comfortable shoe is the individual variations in what is perceived comfortable (Bishop et al., 2020; Menz & Bonanno, 2021; Nigg et al., 2015). Not only does comfort likely influence a runner’s buying decisions, but it has also been linked with running economy and the occurrence of RRI (Agresta et al., 2022; Bishop et al., 2020; Nigg et al., 2015; Ramsey et al., 2022; Van Alsenoy et al., 2023; Willems et al., 2019). Respondents felt that cushioning, upper width/material, and forefoot stiffness played the largest role in an individual’s perceived comfort. Similar variables were viewed by runners as important to their shoe choices (Xia et al., 2023). Given the variance in individual preferences, Bishop et al. (2020) suggested ‘ideal’ would be the most appropriate anchor for rating comfort characteristics, such as cushioning. Limited research has explored the link between the shoe upper and comfort, despite this being valued by runners (Xia et al., 2023). The current study indicated a difference between groups in which retailers placed greater importance on upper design than others surveyed. This is likely a result of the fact that retailers are more directly involved with assisting runners when purchasing shoes than the other groups and, therefore, more acutely aware of what fitting considerations are important to runners.

The survey found that injury management and prevention are important considerations. This finding is consistent with previous studies on the opinions of runners and those who provide advice on running footwear (Fife et al., 2023; Linton & Valentin, 2020; Ramsey et al., 2020, 2022; Woltho et al., 2020). One of the most unanimously accepted risk factors for RRI is a previous injury (Burke et al., 2023; Fokkema et al., 2023; Sanfilippo et al., 2021). Respondents believed that medial posting and cushioning were the footwear characteristics most likely to reduce the risk of RRI. Currently, there is no conclusive

evidence linking running footwear pronation control characteristics to RRI risk (Clement et al., 1981; Powell et al., 1986; Relph et al., 2022; Vannatta et al., 2020). In a 12-month prospective study of 927 runners (all running in neutral shoes), Nielsen et al. (2014) identified fewer injuries per 1000 km of running in participants with highly pronated feet compared to those with neutral feet. On the contrary, Willems et al. (2021) conducted a secondary analysis of randomised controlled trials and concluded that shoes designed to control pronation reduced the incidence of so-called pronation-related injuries such as Achilles tendinopathy, plantar heel pain, and anterior knee pain. Over half of the retailers surveyed and one in five podiatrists and coaches placed a high value on medial posting. These results are consistent with Woltho et al. (2020), who found that retailers perceived a stronger link between pronation and RRI compared to physiotherapy students.

After medial posting, cushioning was suggested to hold a strong link to injury prevention, a consistent view amongst all groups. Similarly, Xia et al. (2023) surveyed 626 marathon and half marathon runners, identifying ‘cushioning’ as the most important characteristic of a running shoe. The benefit of cushioning in relation to RRI is the purported influence on vertical ground reaction force impact peak and vertical force loading rate (Malisoux et al., 2022; Sun et al., 2020). The link between cushioning and reduced RRI risk has been supported by several recent studies (Malisoux et al., 2020, 2022; Papagiannaki et al., 2024; Sun et al., 2020; Trama et al., 2023). Comparing a large cohort of runners assigned to run in either hard or soft shoes, Malisoux et al. (2020) observed a lower incidence of RRI in those allocated soft shoes. Interestingly, these researchers carried out further stratification based on body mass, revealing that the RRI risk (the likelihood of developing an RRI in the 6-month study period) was higher in light-weight runners who wore hard shoes (Malisoux et al., 2020). While the current study did not examine respondents’ perceptions of cushioning for different body types, weight was reported to be one of the considerations least likely to influence individualised footwear recommendations.

#### 5.1. Strengths and limitations

A key strength of this study was the inclusion of individuals from diverse backgrounds (podiatrists, physiotherapists, retailers, and coaches). This provided unique insight into the differences between these groups, each of which likely appears equally qualified to provide advice regarding footwear selection. We acknowledge that for retailers, the commercial context in which they operate may influence recommendations. However, we believe this does not detract from the value of understanding the advice they provide in real-world settings. Identifying how advice is presented—even when influenced by sales pressure—is essential to understanding the broader landscape of footwear guidance available to runners. Despite efforts by the authors to maximise engagement, the response rate was lower than expected, particularly for physiotherapists and coaches. This reduces the generalisability of the data. The topic of running footwear recommendations may be of interest to only a select portion of these cohorts, which may have introduced some self-selection bias as only those with an interest in this area responded to the survey invitation. We did not gather data in this study regarding the respondents’ personal experiences with running and acknowledge that this may influence their recommendations. It may be of interest in future research to identify how advice differs if the person giving the advice is a runner themselves. Finally, as this was an online survey, there may have been some degree of response bias, particularly if some participants were unfamiliar with certain footwear characteristics described in questions.

#### 5.2. Future directions

Limitations in available evidence make it difficult to recommend optimal footwear aimed at reducing the risk of RRI (Malisoux & Theisen, 2020; Richards et al., 2009). Research on the topic of individualised

recommendations for running footwear is restricted by the current lack of clarity regarding how individual footwear characteristics influence RRI. This continues to be an important focus for footwear researchers, and the further development of this work is essential before evidence-based guidelines for individualised recommendations can be developed. Future research would benefit from considering how individuals are assessed for their footwear requirements in both a clinical and retail setting, and how this information is translated into recommendations. Resources could be created that detail which risk factors for RRI may be modifiable via footwear and how assessment findings may predict an individual's response to specific footwear characteristics. Research should support the development of these resources through consensus statements and further analysis of how or if the assessment of an individual can predict that person's response to footwear characteristics. Additionally, any resources of this nature would need to be updated regularly as evidence improves and available footwear models evolve.

## 6. Conclusion

Notable differences exist between podiatrists, physiotherapists, footwear retailers, and running coaches regarding their individualised recommendations of running footwear. Podiatrists and retailers more regularly and confidently provide such advice and are more likely to recommend footwear based on pronation control. These findings offer novel insights into what constitutes an individualised footwear recommendation and the factors that influence this advice. This information may serve as a valuable resource for experts to reflect on their own recommendation practices and consider how they align with those of their peers. Additionally, these findings can help guide future research by clarifying the behaviours and decision-making processes that warrant further investigation, ultimately contributing to a better understanding of the validity and impact of expert footwear advice.

## CRedit authorship contribution statement

**Aaron Jackson:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Kelly Sheerin:** Writing – review & editing, Methodology, Conceptualization. **Mike Frecklington:** Writing – review & editing, Methodology, Conceptualization. **Matthew R. Carroll:** Writing – review & editing, Methodology, Conceptualization.

## Consent for publication

The participant information page at the beginning of the survey advised participants that anonymous, non-identifiable data would be published. Only data from those who consented has been included.

## Data availability statement

The data supporting this study's findings are available on request from the corresponding author ([aaron.jackson@aut.ac.nz](mailto:aaron.jackson@aut.ac.nz)). However, due to privacy or ethical restrictions, the data are not publicly available.

## Disclosure statement

All authors declare no competing interests.

## Ethics statement

Ethical approval was granted by the Auckland University of Technology Ethics Committee (AUTEK). Application reference 23/93.

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## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Abbreviations

NZ	Aotearoa/New Zealand
RRI	Running related injuries

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pts.2025.07.010>.

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