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Preferred design features for cycling clothing comfort

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ABSTRACT

This study investigated design preferences for cycling clothing among competitive cyclists. An online survey was conducted to gather opinions on fit, design features and perceived comfort of cycling jerseys. 115 cyclists completed the survey. The survey targeted road and off-road cyclists, with a focus on participation in competitive events.

The results showed that tight jerseys and padded bib shorts are preferred for training, while skinsuits are favoured by over 40% in competition. Most cyclists prefer jersey sleeve lengths that extend at least halfway down the upper arm and shorts with a length between 1/2 and 2/3 of the thigh. Elasticated cuffs are commonly favoured for both sleeves and leg grippers.

Fit is a critical factor, with the waist and back length of jerseys and the bib length and chamois position of shorts being the most challenging to fit. Female cyclists reported more difficulties with shorts fit, particularly concerning thigh fit and chamois width, compared to male cyclists.

Overall, the study indicates that preferences for cycling clothing are generally similar across genders. These findings provide insights for clothing manufacturers to enhance the design and comfort of cycling apparel, addressing the specific needs and preferences of competitive cyclists.

KEYWORDS

Comfort, cycling, clothing, survey, cyclist.

Introduction

Cycling clothing for competitive riders is worn for many hours during training and competition. Detailed design features can make riders accept or reject designs based on anecdotal evidence, fashion and media. For sports garments, fit and comfort have been identified as the most important factors for purchasing decisions, with a higher ranking than price (Wilfling et al., 2022). The fit, fabric and design of cycling clothing has been shown to be more important than thermal properties for comfort (Teyeme, 2020). A user survey showed that fit of cycling clothing influences the perceptions of moisture permeability, with better fitting garments being perceived as having good breathability (Teyeme et al., 2022).

Design of cycling clothing can vary in terms of materials and pattern. Some elements (e.g. sleeve length) can vary more than other elements between brands and designs (Teyeme et al., 2022). Example features include leg grippers ranging from rubberised strip to 200mm bands; sleeves being laser cut or with a seamed elastic edge; pads (chamois) being multiple designs. Cycling shorts with

a chamois pad are designed to be worn without underwear to maximise comfort and reduce chafing (Harrison and Edey, 2023), but their design and fitting method varies between brands.

This study aims to elicit current opinion on cycling clothing design, technology and fashions, to obtain an up-to-date view of cyclists' preferences.

Method

115 cyclists completed an anonymous online survey on 'Design and Comfort of Performance Cycling Clothing'. Section 1 focused on personal information including age, participation in events and hours ridden per week. Section 2 focused on cycling jerseys (tops) and considered preferences for training and competition, sleeve design, and which parts of the jersey is most difficult to fit. Section 3 focused on cycling shorts and considered preferences for training and competition, leg design, which parts of the shorts are most difficult to fit, and the design of the chamois.

The study was promoted via social media, cycling clubs and race teams and was specifically targeted at competitive cohorts. The study was approved by Nottingham Trent University research ethics committee (1890793).

Participants were classified into 'road' and 'off-road' groups. Road riders were classified as those who participated in 6 or more club rides, sportives, road races, or time trials in the past 3 years. Off-road riders were classified as those who participated in 6 or more mountain bike (MTB), gravel or cyclocross (CX) events in the past 3 years. Those who participated in both road and off-road events were classified into both groups.

Results

Respondents comprised 67 males, 47 females, 1 unspecified. Each of the 5 age categories included at least 14 respondents and ranged from 18-22 years to 60+ representing Junior/U23, through to Super Veteran UCI race categories. 84% had ridden in a social group (club ride) in the past 3 years; 46% had participated in 'Sportive/Grand Fondo' that are considered non-competitive. Off-road competition were the most popular race disciplines (CX 64%, MTB 51%, gravel 42%). Road competition had participation of 36% and 35% for time trials and road racing respectively. 69% rode for more than 7 hours per week.

There were differences between preferred jersey and shorts in training and competition ($p < 0.001$, χ^2). This is as expected as skinsuits are designed for competition use providing aerodynamic benefits, ideal placement of garment components in race posture, consistent fit and lower weight. Skinsuits have less opportunity to carry spares and nutrition in pockets, cannot be easily adjusted, are less compatible with bathroom breaks and costly, meaning that they are rarely used in training as shown here. Tight jerseys were preferred by 76% of the sample during training; 18% preferred loose. In competition 53% preferred 'tight' with 42% preferring 'skinsuit' jerseys. Padded bib shorts with straps were preferred by 82% of the sample during training. In competition 46% preferred padded bib shorts with straps, with 43% preferring skinsuits. The trend was observed across both genders and across disciplines (Figure 1).

Figure 1. Preferred types of cycling jersey (left) and shorts (right) in training (top) and competition (bottom) for male and female road and off-road cyclists.

Preferred jersey sleeve length was at least 1/2 way down the upper arm with 49% preferring 'about 1/2 way between shoulder and elbow' and 43% preferring 'about 2/3 way between the shoulder and elbow'. The most popular shorts length was 1/2 to 2/3 thigh length (51%). 10% preferred shorter; 38% longer. Males had a consistent preference for longer sleeve and leg lengths (Figure 2). The most preferred sleeve edge and leg cuffs were sewn-on elasticated cuffs. Male cyclists showed more preference than female cyclists for silicone grippers for both sleeve and shorts.

Figure 2. Preferred designs of cycling jersey (left) and shorts (right) for sleeve / leg length (top) and gripper (bottom) for male and female road and off-road cyclists.

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The most preferred chamois thickness was 10-14mm (52% of respondents). 42% of females preferred thickness greater than 15mm compared to 29% of males, although this difference was not statistically significant. Male and female groups both considered pad shape, quality of stitching to fix to shorts, padding material, and position in the shorts as the top 4 considerations for comfort. Females considered pad shape more important than males ($p<0.05$, χ^2). It should be noted that cycling shorts are gender-specific and have different designs of chamois for men and women.

The waist and back length were reported as the most difficult part of a jersey to fit (Figure 3). The bib length and chamois position were considered the most difficult parts of shorts to fit for both males and females. Thigh fit (too tight) and chamois width were more difficult to fit for females than males.

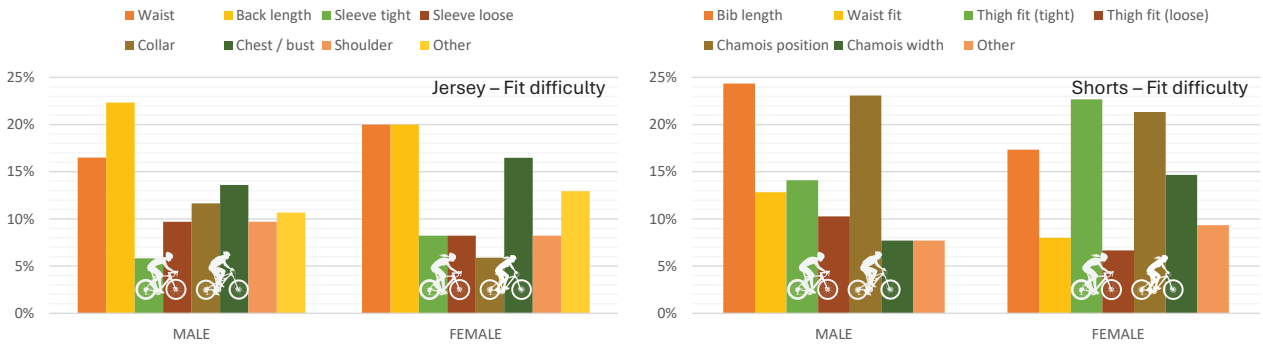

Figure 3. Most difficult parts of cycling jerseys (left) and shorts (right) to fit for male and female cyclists.

Conclusions

This study has shown that preferences for cycling clothing are generally similar for males and females. The shortest designs of arms and leg lengths were the least popular. Elasticated cuffs were the most popular grippers for arms and legs. Females found more difficulties in fit for chamois than males. This study provides a baseline of clothing design factors that are considered important by cyclists and can help target future development of sports apparel.

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