Coaching Sprinting: Expert Coaches’ Perception of Resistance Based Training

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ABSTRACT
The aim of this study was to explore expert coaches’ perceptions of resistance-based training for sprinting. This research posed three broad questions: i) What resistance exercises are being performed by competitive sprinters? ii) Why coaches have selected these exercises over others? iii) How athletics coaches control and implement their use in training? Participants for the study comprised of seven expert track and field sprint coaches. Findings indicated that the coaches used a variety of resistance-based training including variations of the squat, Olympic weightlifting movements and deadlift, along with resisted running in the form of weighted jackets, hill running and weighted sleds. They also used plyometric variations of bounding and specific drills. Particular emphasis was drawn towards variations of the squat and how exercises transferred from the weights room to the track. All coaches changed exercises to complement the focus from off-season to in-season. The main finding of this study relates to the current dearth of research to support evidence based resistance exercise prescription for sprinters.

Key Words: Coaches, Perceptions, Weight Training, Resistance-based Training, Sprinting, Track and Field Athletics.

INTRODUCTION
The area of coaching science and coaches’ knowledge about training has become more popular in recent years. The breath of research has predominantly been quantitative in nature, ranging from the biomechanics of running [1] to the effect of resistance-based training on sprint performance in general [2,3]. Qualitatively, research has focused on the pedagogy [4,5], sociology [6] and psychology of coaching [7], with few studies focusing specifically on sprint coaches [7,8]. The framework for this paper is to explore coaches’ views on resistance training, it will ascertain what, why and how coaches select and monitor their resistance-based training for sprinters. This approach is flexible in nature and allows for further exploration of the coaches’ rationale for using different training methods using a survey style approach [9,10].

There is a plethora of research on resistance-based training for speed development on team sports [2,11,12]. Research specific to athletics, in particular sprinting performance, is sparse [3]. Sprint coaches have a vast amount of research to choose from in the team sports realm, yet within their own realm it is more difficult for them to select exercises based on the available research. Even fundamental exercise selection can range from regular full range of movement squats [11], variable range of motion squats [11,13,14], squat jumps [15], banded squats [16,17], all of which show performance improvement, yet the specificity for the sport of sprinting is unclear [18–21].
Research (33) has shown a need to bridge the gap between researchers and practitioners with regard to resistance-based training interventions [3]. Coaches have indicated that they are less likely to look for research about physical training but are happy that sports science is contributing to this area [22]. Coaches are more likely to seek research in the area of tactics and strategy, and feel that the area of sports psychology is being best represented from a needs versus demands perspective [22]. Several studies [24–26] have suggested that more experienced coaches are more likely than the less experienced coaches to believe that coaches in their sport have access to sport scientists and indicated that this access may be through an unmediated process; i.e. personal contact. Overall, sport scientists and sports science journal articles and databases ranked low as a source of new ideas for training [22]. Ease of access to research in conjunction with more review style papers provide a more desirable method of transfer of knowledge for coaches [22]. On the basis of this evidence, there is a gap in the transfer of knowledge from sport scientists to coaches.

Many published papers discuss an array of outcome performance measures to help track performance, such as squat jumps, counter movement jumps [27], 1 repetition maximum [28], power output [27], and sprint times (10-60 m) [29]. How do sprint coaches monitor their training variables and how do they make evidence based adjustments to training as the season progresses? Many coaches do not have access or the financial backing [22] to provide such a service. The aim of the current study was to explore expert coaches’ perception of resistance-based training for sprint performance. This research sought to ascertain firstly what exercises this population are using, and secondly to find out why coaches have selected these exercises over others and how they control and implement their use in training.

METHODS

PARTICIPANTS

A purposeful sample of seven (n=7) expert track and field sprint coaches was selected. In line with previous work [7,30], the coaches were classified as expert based on three criteria: experience, qualification and achievement. A minimum of ten years sprint coaching experience was deemed necessary. Each coach was required to be higher than level three under Athletics Association of Ireland’s (AAI) coaching structure, which is the equivalent to level four with the International Association of Athletics Federations (IAAF) (either currently or previously). Finally, each needed to have coached at least one international level athlete. This study complied with the University’s Board of Ethical Compliance and Athletics Association of Ireland ethics regulations. Ethical approval was gained from the University’s Research Ethics Committee. Each coach gave written informed consent to participate in the study.

DATA COLLECTION

Semi-structured, in-depth interviews were used to explore the coaches’ perceptions in terms of the stated aims of the study: that is, if they used resistance-based training both on and off the track, what specifically was used, and why? The interviews also explored how the exercises are implemented and monitored over a training plan? This research approach is flexible in nature allowing for further exploration of the coaches’ rationale for using different training methods [10,31]. In order to extrapolate the information, an interview guide was developed, which identified three broad themes (Figure 1). Theme one focused on what resistance-based training was being used. This began by ascertaining background information relating to the types of resistance-based exercises that the coaches used in training both on and off the track and their approach to planning these exercises.
Coaching Sprinting: Expert Coaches’ Perception of Resistance Based Training
two investigated why the coaches chose these movements over others and what sources of
information they used to justify their selection. Theme three identified how the coaches
monitored their training plan from the start to end of season and included any tests used to
track performance. Each theme had a probing strategy to ensure the answers to the
questions were attained.

All interviews were digitally recorded and transcribed verbatim. Each coach was interviewed
once, with each interview lasting on average approximately forty-five minutes. The
interviews took place in a venue of the respondent’s choice. A pilot study was conducted
which aided in the design of the semi-structured interview guide. Finally, the transcribed
interviews were offered to the coaches to check for accuracy and completeness of
interpretation.

Figure 1 – Thematic mind map of semi-structured interview.

**DATA ANALYSIS**
A six stage data analysis process was undertaken in accordance with Braun and Clark [10].
The data were analysed inductively, which involved organising and moderating the collated
data into themes and constructs. This involved an initial familiarization stage, which included
reading the data and noting ideas. Codes were then identified across the entire data set,
which later developed into identifiable themes. Themes were then reviewed and defined in
context with the overall aim of the study. Data were analysed in NVivo software (QRS NVivo
10) [32] using inductive reasoning. Open coding of each participant’s transcript allowed
concepts and themes to emerge from the data. A constant comparative method [33] was
used to analyse the data which is in line with previous study methods [7,8]. To achieve this,
a constant comparative method was used until data saturation was reached (i.e. a point at
which no new information or constructs were observed). The outcome resulted in several
higher order constructs being established and grouped based on the criteria of being most
cited by the coaches in question.

**RESULTS AND DISCUSSION**
Following analysis of the transcribed interviews, three higher order constructs were
identified. These constructs are presented in three broad themes, as outlined in Figure one.
For the purpose of clarity, resistance-based training includes any form of resistance applied
to the body, either on or off the track to facilitate adaptation for sprinting performance.
Coaching Sprinting: Expert Coaches’ Perception of Resistance Based Training

Coaches agreed that resistance-based training can take many forms and that they use a combination of weight training, plyometrics and resisted running with their athletes. The calibre of the coaches can be seen in Table 1, which shows the collective years of coaching experience along with the qualifications of each coach and their coaching disciplines. It is also noteworthy that five out of seven coaches attained a national level professional strength and conditioning qualification.

Table 1 – Coaches’ Demographic Information

<table>
<thead>
<tr>
<th>Participant Code #</th>
<th>Discipline:</th>
<th>Currently Coaching</th>
<th>Coaching Experience (years)</th>
<th>Coaching Award Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sprint (S)</td>
<td>Males (M)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Jumps (J)</td>
<td>B</td>
<td>27</td>
<td>IAAF Level 5</td>
</tr>
<tr>
<td>2</td>
<td>Hurdles (H)</td>
<td>B</td>
<td>28</td>
<td>AI Level 3</td>
</tr>
<tr>
<td>3</td>
<td>Multi Event (M)</td>
<td>B</td>
<td>10</td>
<td>AI Level 3 &amp; IAAF Level 4</td>
</tr>
<tr>
<td>4</td>
<td>Cross Country (CC)</td>
<td>B</td>
<td>19</td>
<td>UK Level 3</td>
</tr>
<tr>
<td>5</td>
<td>S</td>
<td>B</td>
<td>10</td>
<td>IAAF Level 4</td>
</tr>
<tr>
<td>6</td>
<td>S, J</td>
<td>B</td>
<td>15</td>
<td>AI Level 3</td>
</tr>
<tr>
<td>7</td>
<td>S, J, M</td>
<td>B</td>
<td>10</td>
<td>IAAF Level 5</td>
</tr>
</tbody>
</table>

Note Athletics Ireland (AI) and United Kingdom qualifications have been given International Association of Athletics Federation (IAAF) equivalent values.

THEME ONE – WHAT

All seven coaches interviewed used resistance-based training to prepare sprinters for competition. Six coaches used programmed sessions in the weights room. The remaining coach favoured more movement-specific work on the track over the weights room stating:

Coach #1
“A couple of our athletes are going to the weights room, the vast majority of them don’t.”

“So many of the movements in the weights room, they’re just not appropriate for what they’re wanting to do. They may make them stronger, but in a way that they’re not going to be using on the track, so it’s pointless, we have got to make sure, they train really quite hard, so to be doing anything that is not very specific to their event as far as I’m concerned is pointless.”

The most prevalent exercises used by these seven coaches are split into the following three categories: resistance training, resisted running, and plyometrics. These exercises are displayed in Table 2 and show a wide range of track and weights room based resistance training.
Table 2 – Resistance-Based Training Frequency

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Barbell Squat</td>
<td>6</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Olympic Weightlifting</td>
<td>5</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Deadlift</td>
<td>4</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Dynamic Effort</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Box Jump</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Single Leg Exercises</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Medicine Ball</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>RDL</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lunges</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PAP</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Gluteal Ham Raise</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed Endurance</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step Up</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leg Press</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Frequency refers to the number of coaches who reported using a particular exercise. RDL = Romanian deadlift, PAP = Post activation potentiation, AB skips = A = marching A skip, B = marching B skip and SAQ – Speed agility and quickness.

The barbell squat, deadlift and Olympic weightlifting variations ranked among the most frequently prescribed exercises used by the coaches for resistance training. Four of the coaches used their own variations of these exercises (see Table 3). The back squat and the Olympic weightlifting movements appeared to be the ones most modified by coaches. One coach used what they termed the ‘¼ squat’ along with ‘squat jumps’, while another coach specifically mentioned using a ‘¼ squat’. Research by Hartmann et al [14] on variable range of motion squats questions the necessity to use partial ranges like the ¼ squat, while others are advocates of this method [13,34].

Table 3 – Squat Variations Frequency

<table>
<thead>
<tr>
<th>Squat Variations</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loaded Squat Jump</td>
<td>4</td>
</tr>
<tr>
<td>Full Squat</td>
<td>3</td>
</tr>
<tr>
<td>Split Squat</td>
<td>2</td>
</tr>
<tr>
<td>Parallel Squat</td>
<td>2</td>
</tr>
<tr>
<td>Banded Squat</td>
<td>1</td>
</tr>
<tr>
<td>Single Leg Squat</td>
<td>1</td>
</tr>
<tr>
<td>Front Squat</td>
<td>1</td>
</tr>
<tr>
<td>¼ Squat</td>
<td>1</td>
</tr>
<tr>
<td>⅓ Squat</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Frequency refers to the number of coaches who reported using a particular exercise.

Five of the coaches used parallel or above range of movement (ROM) squats, while one coach promoted the use of full ROM squats to facilitate adequate strength development. According to Wilson [35] and Zatsiorsky and Kraemer [36], if peak force is realised during a short segment of the movement amplitude, there should be no necessity for training the maximal strength over the whole range of motion. Whilst this line of argument is mimicked by the coaches’ views below, it is by no means conclusive.
Coach #2
“I would call it a ⅓ squat which is half way between standing and parallel, similar to a counter movement jump. Looking for the stretch reflex to come back from the bottom of the lift.”

Coach #4
“Yes more of a partial squat, I mean I have heard of the benefits of the full squat with regard to VMO activation, but I think you can potentially activate them in other ways.”

Coach #5
“I use knee angles of similar to a block start or set position, so you’re statically holding in that position coming down and then exploding up.”

Coach #6
“Squat jumps- not a huge depth looking for a reactive jump, with fairly high loading.”

Coach #7
“I probably, would go to parallel, I think anything below that is a bit of a waste of time.”

Contrary to the above views, coach #3 had an alternative view point about the ROM of the squat, which is mirrored by the views of Hartmann [14], who’s findings contest the concept of superior angle-specific transfer effects. Hartmann’s findings suggest that deep front and back squats guarantee performance-enhancing transfer effects of dynamic maximal strength to dynamic speed-strength capacity of hip and knee extensors compared with quarter squats. This is also evident, in a recent meta-analysis by Seitz et al [11], who’s findings suggest that the greater the improvement in back squat strength, the greater the improvement in sprint performance.

Coach #3
“So yes I’m promoting good depth not knee twitches, developing core strength through a full range of movement and then developing specific strength in a smaller more specific range of movement. What I think generally happens is people try to make it too specific, and try not to develop the strength. I think it’s one of the weaknesses with a lot of athletes, that they are not strong enough.”

Variation was also evident with the Olympic weightlifting movements with different coaches favouring the ‘high pull’, ‘snatch’, and ‘clean’ variations over other exercises (Table 4). Six of the coaches use some form of Olympic weightlifting movement in training.

Table 4 – Olympic Weightlifting Variations

<table>
<thead>
<tr>
<th>Olympic Weightlifting Variations</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Pull</td>
<td>2</td>
</tr>
<tr>
<td>Snatch</td>
<td>2</td>
</tr>
<tr>
<td>Cleans</td>
<td>2</td>
</tr>
<tr>
<td>Power Cleans</td>
<td>1</td>
</tr>
<tr>
<td>Hang Cleans</td>
<td>1</td>
</tr>
<tr>
<td>Split Snatch</td>
<td>1</td>
</tr>
<tr>
<td>Split Clean</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Frequency refers to the number of coaches who reported using a particular exercise.
Coach #1
“If you’re strong doing a clean, well where exactly does that movement come into sprinting. And if I can’t justify doing the clean then we don’t do it, simple as that.”

The other coaches use variations of the clean, including the full clean, hang cleans, split cleans, power cleans and snatches. They also place emphasis on the time necessary to learn the correct technique and use partial variations to aid in promoting development through the triple extension phase of the lifts.

Coach #2
“Particularly with the Olympic lifts we spend a lot of time just with the bar learning technique. We use wooden disks the size of regular Olympic discs, put them on boxes and start from there. They’re learning the actual mechanics of learning to lift.”

Coach #3
“Olympic lifts even though they are more technical, if you’re caught for time you can substitute in dynamic exercises such as dynamic squat, and jump squats in order to compensate for that.”

Coach #4
“So the first phase to mid-thigh ... The top portion is where you use more in sprinting anyway, I feel. I used to hang snatch, with the split landing, again very specific to sprinting.”

Coach #7
“I’m a great believer in cleans and snatches and if you can do split snatch, even split cleans, I think you’re on to something that’s more specific towards the movements in athletics.”

The use of Olympic weightlifting variations for sprint performance improvement has been demonstrated by Haouachi et al [37] in a study which compared traditional weight training with plyometrics and Olympic weightlifting. Their study suggested that 12 weeks of Olympic weightlifting or plyometric training were generally equal to or more effective for enhancing performance than traditional resistance training (RT) in males. In summary, Olympic weightlifting training was likely to provide better improvements than plyometric training for CMJ, horizontal jump, five metre and twenty metre sprint times. One coach even attributed breaking personal bests to his ability to perform a 1RM maximum clean in the week proceeding a national sprint final event stating:

Coach #7
“I could nearly chart, I broke three [national] records one time in two years like it was 100 m, and the Wednesday before the Sunday / Saturday race I set PB’s for cleans at 1RM.”

This view has support by the work of Hori [38] whose study investigated whether the athlete that has high performance in hang power clean, has high performances in sprinting, jumping, and change of direction. The findings suggested that the athletes possessing the greater 1RM hang power clean relative to the body mass also possessed greater maximum strength, power and performance in jumping and sprinting.

In the current study, resisted running and plyometrics provided the most congruency amongst coaches who used a weighted jacket, hill running and plyometric bounding or variations of them. ‘Weighted jacket’ and ‘hill running’ were amongst the most commonly used form of resisted running along with ‘weighted sleds / tires’ and ‘bungee cords’. The use of these forms of resisted running is supported by research [39,40] in particular during the acceleration phase from the blocks. However, there is still some debate as to whether these
forms of resisted running aid or hinder technique and ultimately sprint performance [41–43]. The plyometric exercises used by coaches in the current study included variations of ‘bounding’, including ‘single’ and ‘double leg’ variations, ‘uphill bounding’ and ‘AB skip’ variations. ‘Hurdles’, ‘depth jumps’ and ‘ankle hops’ were also used to apply resistance to the sprinters on the track. These have been extensively researched and have been proven to improve both technique and performance of sprinting [12,44].

THEME TWO – WHY
All of the coaches provided their rationale for including or excluding exercises based on a combination of experience and trial and error. Most coaches held the opinion that resistance-based exercise is a useful supplement to aid sprint training. Why the coaches selected particular exercises and phases of training ranged in response, with most favouring an emphasis towards strength training in the off-season with a shift in focus towards more reactive type strength training during the in-season.

Coach #1
“Generally we start in September, and we would work progressively hard all the way up to Christmas.”
“I’ll be doing three weeks of speed work. But it’s still quite hard speed work, but it’s speed work. So I suppose, I wouldn’t necessarily call it a taper but, they’re certainly doing slightly different work, in these three weeks leading up to the championships.”

Coach #2
“It depends on the period of the year, and whether you’re building muscle in terms of hypertrophy, or whether you want to build explosive strength or endurance.”
“Building strength, that’s stressing the body and then the body accommodates to that stress, and then you have to change the stressor, you either increase the weight, you decrease the recovery, increase the number of repetitions, increase the number of sessions within the cycle, so you have to change the stressor.”
“Building up strength speed dynamic strength, explosive strength, speed endurance, they would build up all the components of fitness and when they’re right they would go into competition.”

Coach #3
“My philosophy would be very firmly in that they need strength development.”
“So developing a good sound base of strength and then, working across the entire force velocity curve.”

Coach #4
“I actually do find that high velocity closer to competition time made more sense. I’d still probably have some lower velocity heavier work in there as well just not as high in volume.”

Coach #5
“It’s definitely a hybrid approach .... I rotate in four week blocks, speed week, power week, max strength week, and an endurance or regeneration week.”

Coach #6
“There would be a different focus on the strength, once it comes into pre-competition the volume of strength training, be it general maximal or reactive would reduce, and a little bit more speed work and just the general philosophy is the volumes go way down the intensity go up and the recovery gets longer that type of thing.”

Coach #7
“Earlier stages would be a lot more on endurance and strength development yeah again it really depends on the age of the athlete, and their experience..... need to build a reasonable aerobic base, reasonable strength development base and where you are at the end of that 6 weeks it takes you to what your able to do next”
When asked about periodization, all coaches demonstrated knowledge of meso - macro subdivision. Four of the coaches cited using the ‘IAAF model’ to aid splitting the season up into ‘general, specific and transition phases’ where different emphasis was placed based on the individual athlete’s performance goals for that year. The other coaches used modified versions the IAAF model, ‘Bompa’s five phases of training’, ‘Westside barbells conjugate system’, ‘Yuri Verkhoshansky, and ‘Gregory Haff’s’ force velocity approaches. Five of the coaches emphasised a focus on strength in the initial part of the season with a shift in focus to more dynamically orientated exercises as the competitive season approached and during the competition season. On a micro level, the coaches were in agreement about having a 3-4 week wave of intensity with all coaches incorporating a recovery week or unload week into their blocks of training.

Coach #1
“Up to competition season we work on a four-week plan, so progressively, week 1, 2, 3, so in a four week block week 3 is the hardest, week 4 is recovery, and week 1 of the following block is roughly the equivalent to week 2 of the previous block.”

Coach #2
“Normally I would plan in a four-week cycle, with three weeks of training and a week of recovery/regeneration.”
“A three week wave with a recovery week, within that cycle there is always a recovery week/rest built in. I always insist on it because you do need to regenerate.”

Coach #3
“4-week cycle, 3-weeks on and 1-week would be reduced.”

Coach #4
“4 week block, which is part of a 3 month block we try to build up the intensity for four weeks and drop it back a little bit for an element of recovery, generally speaking I let the athletes choose their own comfort loading, in terms of what they feel they can do weight wise. If they’re feeling they need a little bit less than that then that’s fine.”

Coach #5
“I kinda rotate in four week blocks, speed week, power week, max strength week, and an endurance or regeneration week.”

Coach #6
“I take 4 weeks at a time, light, medium and heavy.”

Coach #7
“Week 1, 2, 3, are progressive, week 4 it comes down to probably, below week 1’s intensity and then the next cycle should probably start more in the middle of maybe week 2 so progressive.”

The coaches used different sources to aid them with program prescription. All coaches reported using a combination of books and other national or international sprint coaches. Five of the coaches reported the use of research journals in their decision making process for training. On the whole, the perception was not to use the latest research to drive training but rather to incorporate the depth of knowledge gained over many years and take elements which they felt would add to their approach to coaching. This is reflective of the findings of Reade et al [22] who reported that while coaches seek information, there is no clear point where sports science enters the predominantly coach-to-coach knowledge transfer system. The barriers to the coaches’ access to sports science were the time required to find and read scientific journals, and lack of direct access to a sport scientist.
THEME THREE - HOW

The majority of coaches supervised their own resistance-based session placing particular emphasis on the quality of movement they wanted from each exercise. They had differing approaches to outsourcing strength and conditioning sessions to service providers and had selection criteria which included a basic degree in the area, and experience with athletics as an athlete. All of the coaches tested their athletes during the season, with each coach placing different emphasis on tests based on facility access and time available. Tests on the track included RPE\(^1\), POMs\(^2\), timing gates, medicine ball throws, and acceleration assessment with laser velocity measurement systems. Coaches also reported using measurement tools such as a Fitrodyne\(^3\), Tendo\(^4\), 1RM\(^5\), CMJ\(^6\), drop jump, sit and reach, knee to wall, force plate\(^7\), and chrono jump\(^8\), and RSI\(^9\). All of the coaches reported using video analysis both in the weights room and on the track to monitor technique. The frequency of testing ranged from recording information in every session to recording intermittently every four to six weeks. The emphasis was placed on tracking performance improvement relative to the previous period of training stimulus along with injury prevention. One coach’s philosophy was to use the performance tests to aid in programing for the athletes, shifting the emphasis away from strength to more reactive work in accordance to the athlete’s contact times:

Coach #5

“Since we started testing more … you find out that contact time is becoming too long, they’re not plyometric enough. So I switch to a more plyometric program. I can see from the force plate that when he/she performs a depth jump from 30 cm that the height is phenomenal but the contact times are in the .2’s or .3’s?”

CONCLUSIONS

The expert sprint coaches in this investigation unanimously used resistance-based training with their sprinters. Six used resistance-based training in the weights room, in combination with plyometrics and resisted running. One coach chose not to use the resistance-based training in the weights room, rather choosing to emphasise a combination of on track resistance including plyometrics and resisted running. The most popular resistance-based training exercises reported amongst the coaches were: ‘barbell squat jumps’, ‘weighted Jacket’ and ‘bounding’. The coaches employed variations of these movements, which they felt best aided sprinting performance. The coaches’ rationale for selecting these exercises varied depending on their perception of how they believed the exercises transferred on to the track, resulting in several variations of the squat and Olympic lifts. This proved to be the most contentious construct, resulting in several techniques ranging from the 3/4 squat, to a full squat to no squats at all.

The coaches’ approach to planning was similar. All coaches adopted a modified periodized model, which started with a strength focus and moved towards a more dynamic sport-specific approach as competition approached. All of the coaches monitored their athletes’ progress and used a variety of different testing methods to track performance. Coaches demonstrated a varied approach to the use of primary research to support their exercise

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\(^1\) RPE – Rate of perceived exertion.
\(^2\) POMs – Profile of mood states.
\(^3\) Fitrodyne – measurement of power output and bar speed.
\(^4\) Tendo – measurement of power output and bar speed.
\(^5\) 1RM – One repetition maximum.
\(^6\) CMJ – Counter movement jump.
\(^7\) Force Plate – measurement of ground reaction forces
\(^8\) Chrono Jump – mat for measuring vertical jump, and contact times.
\(^9\) RSI – Reactive strength index.
Coaching Sprinting: Expert Coaches’ Perception of Resistance Based Training prescription. Five of the coaches reported using scientific research but mentioned time and access to both research papers and sports scientists as a barrier to engaging with the research community. The main finding of this study is that coaches use different forms of resistance-based training to improve sprinting performance. The coaches’ perception of the role that evidence-based research has on program prescription is unclear, as there is a perceived barrier to access research, sports scientists, and specifically research for sprinting in athletics. Hence many questions remain unanswered detailing the specific impact resistance-based training has on sprint performance in the sprinting population. It is crucial that coaching professional bodies and research facilities lead the way in bridging the gap between the researcher and the coach to extrapolate further the diversity and magnitude of improvements that have been made in sprinting performance.

REFERENCES:


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