The Psychological Experience of Athletes With Vocal Cord Dysfunction

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Exercise-induced vocal cord dysfunction (VCD) is a respiratory dysfunction where athletes’ vocal cords close prematurely, causing partially or fully obstructed airflow. Due to a resulting severe decrement in performance and lack of efficacious treatments, this study aimed to discover some of the psychological experiences of athletes with VCD symptoms. Semistructured interviews were conducted with five athletes from three different sports and two mothers of participants. Data were coded for meaningful units and themes by the researcher and one independent rater. Ten psychological facets were derived. Based on the data from these five participants, athletes with VCD may have several common psychological experiences, which may possibly be a result of the breathing disorder. The first seven facets highlight that athletes with VCD may be at risk for burnout. The facets identified are a starting point for sport personnel to plan their treatment and support of athletes in their care.

Keywords: vocal cord dysfunction (VCD), sport, athlete, performance, burnout

Vocal cord dysfunction (VCD), also commonly referred to as paradoxical vocal cord dysfunction (PVCD), paradoxical vocal fold movement disorder (PVFMD), and paradoxical vocal cord movement disorder (PVCMD) in the speech pathology literature, is characterized by premature or asynchronous closing of the vocal cord folds during inhalation causing difficulty breathing due to obstructed airflow (Andrianopoulos, Gallivan, & Gallivan, 2000). Symptoms include shortness of breath, throat tightness, high-pitched wheezing or whistling upon inhale, impaired ability to produce vocal sounds, and cough (Newsham, Klaban, Miller, & Saunders, 2002). In spite of the plethora of terms for the dysfunction, the key component for a diagnosis is intermittent adduction of the vocal cords during the inspiratory phase of the respiratory cycle, which results in temporary upper airway obstruction or a sense of obstruction. Upon visual examination of the vocal cords, definitive objective diagnostic criteria includes: (a) a pattern of unusual inspiratory adduction of the anterior two thirds of the vocal cords; (b) a posterior diamond-shaped opening in the cords (though absence of this does not preclude diagnosis); and (c) attenuation of the inspiratory component of the flow-volume loop indicating partial upper airway obstruction (Andrianopoulos et al.; Koester & Amundson, 2002; Rundell & Spiering, 2003).
The majority of patients diagnosed with VCD that occurs only during exercise are elite or intense-training athletes (Rundell & Spiering, 2003). Some research indicates a VCD prevalence of up to 3% of intercollegiate athletes (Rice, Berman, Shapiro, Furukawa, & Pierson, 1985), but this estimation is likely underrepresentative due to the common misdiagnosis as asthma or exercise-induced bronchospasm (EIB) and the masking of VCD when the disorders are concurrent (Pope & Koenig, 2005). For example, 8% of athletes screened for asthma at the 2004 Olympics suffered from VCD (Michaelis, 2007). Rundell and Spiering evaluated during exercise the breathing of 370 athletes with no breathing dysfunction diagnosis. They found that 5% of the athletes exhibited signs of VCD. Though perhaps high for a disorder, VCD is often described as “rare” (Koester & Amundson, 2002, p. 320; Rhodes, 2008). Lack of a clear term for the disorder, and thus a definitive International Classification of Disorders (ICD-10) code, may contribute to the difficulty in obtaining accurate population statistics. Speech pathologists indicate use of the code for “upper respiratory tract hypersensitivity reaction, site unspecified” (code J39.3), and “other diseases of the vocal cords” (code J39.3) for patients who present with VCD (B.A. Russell, personal communication, October 23, 2011).

Upon suspicion, sport personnel can differentiate VCD from asthma by listening for a whistle during inhalation rather than exhalation, and ascertaining if the tightness is in the neck instead of the chest (Koester & Amundson, 2002; Rundell & Spiering, 2003). Patients with VCD do not respond to the antiasthma medications, and there is a lack of consistency in the development of symptoms (Koester & Amundson; McFadden & Zawadski, 1996). In addition, unlike asthma, symptoms of VCD usually spontaneously resolve within five minutes after cessation of exercise (Rundell & Spiering).

Early studies posit psychological stress as a possible cause for developing VCD. Before recognizing it as a disorder that is distinct from asthma, VCD was diagnosed as “Munchausen’s stridor” or “factitious asthma” based on the assumption that patients were feigning symptoms (Christopher, Wood, Eckert, Blager, Raney, & Souhrada, 1983). In the first article that named the disorder “VCD” and identified it as different from asthma, five patients underwent a series of medical and psychological tests (Christopher et al., 1983). The results indicated that the patients were “diagnosed as having a variety of psychiatric disorders, ranging from mild stress-related exacerbation of symptoms to obsessive-compulsive disorder” (p. 1568). Importantly, the authors noted that the psychological testing failed to differentiate these patients from others with severe asthma. Although not elaborated upon, the authors indicate all patients had “varying degrees of secondary gain from respiratory symptoms” (p. 1568). It appears that the presence of mental disorders and secondary gain is the grounds used to suggest the disorder may be an “unconscious somatic expression of dysphoric feelings . . . a conversion disorder” (p. 1569). Failed efforts to accurately reproduce the symptoms lend evidence against the hypothesis of malingering, and the authors rejected the diagnoses “Munchausen’s stridor” or “factitious asthma.”

Psychological stressors and illness are often seen as contributing factors to breathing disorders such as VCD (Sandage & Zelazny, 2004) and asthma (Lehrer, Feldman, Giardino, Song, & Shmaling, 2002; Mathers-Schmidt, 2001). However, unlike asthma sufferers, perhaps due to the limited knowledge of causes of exercise-induced VCD, people who suffer from VCD are often seen as malingers (Lehrer et al., 2002; Wilson, Theis, & Wilson, 2009). Koester and Amundson (2002) asserted that the “primary reason” for the emphasis on psychological factors is due to the original
recognition of the disorder as intractable asthma, rather than a separate disorder. This view led to the assumption that because asthma for these patients was not resolved by conventional methods, the cause may be psychosomatic or fictitious. The possibility that VCD results from psychosomatic conversion or malingering persists in recent literature (Koester & Amundson; Newsham, Klaban, Miller, & Saunders, 2002), perhaps due to the positive correlation between certain VCD and certain psychological characteristics and symptoms.

Current research indicates a correlation between VCD and patients with certain psychological characteristics, such as high achievement, success orientation, and intolerance of failure (Mathers-Schmidt, 2001; McFadden & Zawadski, 1996; Newsham et al., 2002; Wilson, Theis, & Wilson, 2009). VCD also correlates with anxiety, depression, and high levels of stress (Dietrich, Abbot, Gartner-Schmidt, & Rosen, 2008; Mathers-Schmidt, 2001; Sandage & Zelazny, 2004). One study investigating mental health among patients with voice disorders revealed about half of the 30 patients diagnosed with PVFMD (e.g., another term used to describe VCD) had elevated stress, anxiety, and depression scores as compared with a healthy norm reference and as compared with three other types of voice disorders (Dietrich et al., 2008). However, due to the correlational nature of their research, the authors acknowledge they can make no conclusions regarding the role of mental health issues nor can they attribute causes of VCD to psychological characteristics or illness.

It is important to note, of course, that many high-level athletes exhibit these characteristics and do not develop VCD. Likewise, about half of patients with VCD do not experience elevated levels of stress, anxiety, or depression. Furthermore, a significant number of cases have been reported with no obvious psychogenic cause (Wilson et al., 2009). VCD has been diagnosed in babies and toddlers, which the authors surmise makes the cause less likely psychogenic and more likely from an irritant such as allergies or postnasal drip (Sandage & Zelazny, 2004).

Regardless, there appear to be three general categories of VCD used in the extant literature, which are based on possible causes: exercise-induced VCD (EI-VCD), spontaneous VCD (S-VCD), and irritant-induced VCD (II-VCD). The present investigation is concerned with exercise-induced VCD. EI-VCD occurs only during exercise, though there may be various co-triggers (Rundell & Spiering, 2003). Spontaneous VCD includes those for whom there is no apparent trigger (Doshi & Weinberger, 2006), and irritant-induced VCD applies to those who have reflux, postnasal drip, or allergens as the primary trigger (Wilson et al., 2009; Rhodes, 2008).

**Rationale for the Current Study**

Struggling with getting enough air during exercise inevitably makes it difficult to maintain training efforts, especially at a high level of exertion, as lack of oxygen to the muscles can increase fatigue. Although this can seriously affect athletic performance, experts from various domains have failed to develop an efficacious approach for treating the dysfunction. The challenge in finding a treatment seems to be due to the difficulty in identifying the diversity of potential causes for the occurrence of VCD. Speech-language therapy is currently the most recommended treatment for the management of VCD, with mixed results reported, mainly using case studies (Doshi & Weinberger, 2006; Mathers-Schmidt, 2001; Pope & Koenig, 2005; Weinberger & Abu-Hasan, 2009). Speech-language pathologists provide educational training and breathing techniques for the management of symptoms.
In the absence of efficacious medication, techniques targeted at conscious control, or management of the vocal cord function, appear most promising.

Despite the relatively high prevalence of VCD among high-level athletes, and the lack of an efficacious treatment, there is a dearth of research pertaining to how athletes experience the dysfunction. Although research into the pathology, diagnosis, and treatment of VCD has increased over the last two decades, no studies have investigated the associated psychological experience of athletes having the dysfunction. This study therefore goes beyond specific psychological characteristics or symptoms to provide a broader understanding of the athletes’ experience from the athletes’ points of view. To offer better solutions for comprehensive care for those with exercise-induced VCD, the psychological facets associated with this dysfunction were examined and outlined in the current study using in-depth interviews.

**Method**

**Participants**

An e-mail list for swim coaches in the southeast and the listserv for the American Psychological Association, Exercise and Sport Psychology Division (Division 47), were used to solicit referrals of athletes with VCD. Members of these two lists passed on the researchers’ e-mail contact and instructed the athletes to respond if interested or provided the researcher with the athletes’ information. Five athletes responded from the sports of swimming (n = 3), soccer (n = 1), and field hockey (n = 1). All participants were female. All five athletes, when active, participated at a high level in their respective sports (age 16–27, \( M_{age} = 21 \)). Three of the five were currently active at the time of this study. Two of the five (one swimmer and the soccer player) were recently retired. Each of the athletes reported that medical professionals misdiagnosed them with asthma during adolescence (\( M_{age} = 15 \)) before obtaining the correct diagnosis of VCD (see Table 1).

In addition to the athletes, two of the participants’ mothers consented to an interview. Their input was used for triangulation with their daughters’ descriptions. All participants either described themselves or their mothers described them as driven, hard workers, and high-achievers. All maintained 4.0 grade-point averages (GPAs) in school. Because the sample was fairly homogenous on measures of gender, level of participation, onset of symptoms, and personality/behavioral characteristics, themes that emerged were collapsed to uncover the meanings of the psychological aspects associated with VCD.

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Sport</th>
<th>Level</th>
<th>Age first diagnosed</th>
<th>Age during study</th>
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<tbody>
<tr>
<td>A</td>
<td>Swimming</td>
<td>Division 1 college</td>
<td>13</td>
<td>27</td>
</tr>
<tr>
<td>B</td>
<td>Swimming</td>
<td>A/B level age-group</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>C</td>
<td>Swimming</td>
<td>Junior Olympic</td>
<td>15</td>
<td>16</td>
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<tr>
<td>D</td>
<td>Field hockey</td>
<td>Division 1 college</td>
<td>18</td>
<td>25</td>
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<tr>
<td>E</td>
<td>Soccer</td>
<td>Division 1 college</td>
<td>17</td>
<td>20</td>
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</table>
Interviews

The interviews were conducted over the telephone between May and August 2009. The athletes in this study were spread across the country, making face-to-face contact impractical. Because the research pertains to perceptions of one’s own experience with VCD, direct observation was deemed not necessary. After a swim coach or a sport psychology consultant referred the investigator to an athlete, an initial contact call was placed to explain in general terms the purpose of the study, gather general historical information, answer questions, and obtain an e-mail address for the purpose of sending an informed consent.

Once informed consent was obtained, a second call was placed to conduct the interview. To encourage narration, the initial question was open-ended (Mishler, 1986): “Please, tell me about your experience of being an athlete with vocal cord dysfunction.” To build rapport and increase the ease in sharing potentially emotional information, the interviewer shared with the participants that she was diagnosed with VCD, but she avoided sharing her own experience with them. In the role of the researcher, the investigator acted as a learner who asked questions to develop further understanding. A list of questions was asked of and answered by each athlete. During the interview, probing questions were added, for example, “Can you tell me more?” (Mishler, 1996). The interviews were audiotape-recorded and transcribed verbatim, including laughter, tears, and lengthy pauses. This interview lasted for an average of 1.5 hours.

Interpretation

Each transcript was read several times to grasp its meaning as a whole. Three of the athletes received follow-up calls after the interview for clarifications and to provide a member-check (Patton, 2002). Member-checking is a validation technique used to improve the accuracy and credibility of qualitative research. Members were given a chance to approve or amend the transcripts of their comments. This was especially important to assure understanding and avoid biased interpretations. A second researcher also coded data to minimize research biases.

Inductive Content Analysis

An inductive content analysis (Patton, 2002) was carried out to determine the meanings of the experience. The transcripts were first divided into meaningful quotes, which are the pieces of any length of text that express one meaning. The quotes were then compared and sorted to identify meaningful connections. These connections emerged directly from the participants’ own facets of experiences. These facets were then condensed to meaning units, again referencing the original intent in the textual data.

Of note is that no one facet represents one athlete’s experience. Each of the facets was indicated by more than one of the participants. Although there are undoubtedly unique aspects of the experience among these athletes, the meaning of their experiences appeared similar. The potential advantage of this method is that “the development of convergent lines of inquiry” (Smith, 1988) can possibly provide more credible and clearer patterns. An additional researcher also independently coded the data to establish reliability. The accuracy rate was 89%.
Results

Results included 10 psychological facets (themes) and 20 meaning units emerging from the data. The ten facets are: (1) physical exhaustion, (2) emotional exhaustion, (3) devaluing sport, (4) feelings of isolation, (5) reduced accomplishment and confidence, (6) questioning athletic identity, (7) onset or worsening mood, (8) determination, (9) denial and lack of fear, and (10) unfairness. All but three of the facets were mentioned by all five of the athletes; four of the five athletes described mood changes, three of five mentioned questioning athletic identity, and two of five mentioned unfairness.

Of note, the emotions of anxiety and frustration were pervasive and, consequently, they were coded for the direction of the emotion rather than as a separate theme. As an example, frustration directed toward having to stop working out due to difficulty breathing was coded as a ‘reduced sense of accomplishment and confidence.’ Taken in the context of the quote, this made sense (see Table 2).

Table 2  Facets Pertaining to Athletes With VCD

<table>
<thead>
<tr>
<th>Facets</th>
<th>Meaning Units</th>
<th>Example Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical exhaustion</td>
<td>• Drained beyond normal exertion</td>
<td>“My legs wouldn’t recover, and they told me that’s because I wasn’t getting oxygen to my legs. I was fatigued all the time.”</td>
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<td></td>
<td>• Unable to recover quickly</td>
<td>“I have a lot of energy right before I have a [VCD] attack, but right after, I am drained, and I feel weak.”</td>
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<tr>
<td>Emotional exhaustion</td>
<td>• An accumulation of emotions associated with the struggle</td>
<td>“Psychologically, I’m just exhausted from doing it [dealing with VCD in her sport] and everything that goes along with it.”</td>
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<tr>
<td>Devaluing sport</td>
<td>• Question benefits/costs of sport</td>
<td>“Sometimes I think there’s no point in me getting back in the pool and just have another attack, basically.”</td>
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<td></td>
<td>• Loss of enjoyment</td>
<td>“I’ve been putting up with this for 2.5 years now. [People] would say you’re not pushing yourself hard enough, And I can only play 15–20 minutes at a time, and it’s just not enjoyable anymore.”</td>
</tr>
<tr>
<td>Feelings of isolation</td>
<td>• Others don’t believe</td>
<td>“[Others] don’t understand because they’ve heard of exercise-induced asthma and they ask, ‘Are you using inhalers? Why don’t you do this or that?’ They don’t get it. It can’t be fixed, because obviously I would if I could . . . Everyone thinks there is a solution, a pill, or something, and I’m like, ‘no.’”</td>
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<tr>
<td></td>
<td>• Others don’t understand</td>
<td>“I’m my doctor’s first case so he thinks it’s interesting.”</td>
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<tr>
<td></td>
<td>• Self doesn’t understand</td>
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<td></td>
<td>• Constantly defending self and explaining condition</td>
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</tbody>
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(continued)
Table 2 (continued)

<table>
<thead>
<tr>
<th>Facets</th>
<th>Meaning Units</th>
<th>Example Quotes</th>
</tr>
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<tbody>
<tr>
<td>Reduced accomplishment</td>
<td>• Lack of success in practices and competition</td>
<td>“I’ve been like this for so long that I’ve forgotten what it feels like to be in shape the way I used to be.”</td>
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<tr>
<td>and confidence</td>
<td>• Questions ability to achieve again</td>
<td>“My confidence, it’s chipping away. [Having to stop due to VCD is] just so aggravating!”</td>
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<td></td>
<td>• Distrust of body</td>
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<td></td>
<td>• Sense of being perpetually out of shape</td>
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<tr>
<td>Questioning</td>
<td>• Questions athletic ability (and if still an athlete)</td>
<td>“I spent all this time and effort my whole life so I would say I’m an athlete, but [I look at what I do and] I guess not.”</td>
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<td>athletic identity</td>
<td>• Exploration of other activities to expand sense of self</td>
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<td>Onset or worsening mood</td>
<td>• Onset or worsening of depression and/or anxiety</td>
<td>“I thought we were losing her; she was so depressed, and she’d never been like that. She’s really hard on herself. It was horrible.”</td>
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<td></td>
<td>• Greater mood fluctuation in training and competitions</td>
<td></td>
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<tr>
<td>Determination</td>
<td>• Not quitting in practice or competition</td>
<td>“It gets to the point where I get so aggravated that whatever I’m aggravated with, I do it more.”</td>
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<td></td>
<td>• Increased resolve to perform better or try harder</td>
<td>“I never stop. How do I put this—I have to be forced to stop. I have to be dragged out of the pool, or else I’ll keep going.”</td>
</tr>
<tr>
<td>Denial and lack of fear</td>
<td>• No changes in behavior due to likelihood of an attack</td>
<td>“[My daughter] said, ‘I’m going a 56 in my 100 back as soon as I get back, and I don’t care if I pass out.’ She doesn’t care! I said, ‘No way, I don’t care how fast you go, but swim it and get out of the water.’ And she said, ‘Nope. I’m going a 56.’ She has that cocky, type A personality, you know? She says, ‘I’m gonna prove it to everyone!’ There is no stopping her!”</td>
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<tr>
<td></td>
<td>• No changes in self-talk approach to challenges (e.g., goal times, hard workouts, high-level competition)</td>
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<td></td>
<td>• Low tolerance for injury complaints or excuses from teammates</td>
<td>“‘Why isn’t she as bad as me?’ And, I really don’t know the answer to that. I don’t know.”</td>
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<td>Unfairness</td>
<td>• Realization that dysfunction severely hinders performance</td>
<td>“I look at [my teammates] on the wall complaining about their shoulders hurting or whatever, and I think about how they wouldn’t complain about that if they had what I have. This [VCD] is so much worse.”</td>
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</table>
Description of the Ten Facets

**Physical Exhaustion.** All five athletes reported feeling physical exhaustion beyond normal exertion fatigue due to their inability to get sufficient oxygen, and also due to their inability to recover effectively. The soccer player reported, “It takes a lot of power to shoot a ball or put finesse on a ball to put it where you want to, and that takes a lot of energy. My legs wouldn’t recover, and they told me that’s because I wasn’t getting oxygen to my legs. So, I was fatigued all the time.”

In addition, all five athletes reported frequent VCD attacks during active participation in their sport, at least one every practice and competition. All five athletes said that although their ability to practice hard was curtailed, they had, for the most part, gotten used to the frequent difficulty of getting a full breath. On the other hand, when they suffered an attack (e.g., those episodes when the throat nearly closes off and the high-pitched wheezing gets out of control), they reported feeling completely physically exhausted. One swimmer stated, “I have a lot of energy right before I have a [VCD] attack, but right after, I am drained and I feel weak.”

Two of the five athletes reported the expected sharp increases in heart rate to high levels during sprints, but unlike their teammates, their heart rates would remain elevated for long periods afterward. The soccer player and her teammates wore a heart monitor during practices, and she said hers would stay up the entire practice while her teammates dropped back down during periods of rest.

**Emotional Exhaustion.** The emotional exhaustion is in some ways an accumulation of the emotions associated with other facets. However, all five athletes indicated emotional exhaustion separately. They reported feeling exhausted living with a disorder that keeps them from accomplishing their goals. The athlete who finally decided to quit her sport said, “Psychologically, I’m just exhausted from doing it [dealing with VCD in her sport] and everything that goes along with it . . . pretty much traumatic situations . . . and I just can’t do it.”

**Devaluating Sport.** Sport devaluation suggests an athlete stops caring about sport and his or her performance (Raedeke & Smith, 2001), but the authors also mention that in a sport setting it may appear as cost/benefit analysis of the effort invested. None of the athletes suffering from VCD in the current study reported ceasing to care; they appeared to have a strong devotion to, and passion for, their sports. However, all five athletes indicated that they started to question if the effort was worth the costs. They expressed that they were working harder and seeming to reap fewer rewards than their teammates, and they were not meeting their performance goals. Because every practice was a struggle and many competitions ended with gasping for air, all five mentioned a decrease in the enjoyment they once had. Once this was compounded by the misunderstanding of others, for three of five, it became unenjoyable. A swimmer stated, “Sometimes I think there’s no point in me getting back in the pool and just have another attack, basically. I want to get my cuts, but it’s hard when I can’t even breathe; it’s no fun.”

**Feelings of Isolation.** Because VCD is not as prevalent or as well understood as asthma, all five athletes in this study were first misdiagnosed with asthma. After they failed to respond to prescribed inhalant medications, they were eventually correctly diagnosed with VCD. Each athlete was her doctor’s first patient with
VCD. Not only did the athletes have doctors who were seemingly learning along with them (one mother said she felt as though she knew more about VCD than her daughter’s doctor), there also was no one else on their team or in their social circles who understood the disorder or had even heard of it. The athletes described constantly explaining their condition, sometimes in defense when others attributed their difficulty to malingering, but mostly because others did not understand. One athlete stated, “[others] don’t understand because they’ve heard of exercise-induced asthma and they ask, ‘Are you using inhalers? Why don’t you do this or that?’ They don’t get it. It can’t be fixed, because obviously I would if I could . . . everyone thinks there is a solution, a pill, or something, and I’m like, ‘no.’” In some cases, the lack of understanding was not well-intentioned. The mother of a swimmer told the story of how one of her daughter’s male teammates drew a picture of her with a blue face lagging behind others in practice and posted it on his social media page. One athlete described ridicule from teammates who portrayed her as dramatic. Another claimed that her peers think she is faking the high-pitched whistle.

**Reduced Accomplishment and Confidence.** All five athletes with VCD testified that they experienced less success in competition. Many times they were unable to complete practice. The soccer player and field hockey player reported not being able to compete for the entire game. The swimmers usually completed races, but when symptomatic, either uncharacteristically fell off the pace or sprinted to the end only to collapse on the wall, requiring someone to pull them out. One swimmer reported fainting twice in the water, once in practice and once during a race. A swimmer’s mother expressed her fear every time her daughter races that she will have to run to help her out of the pool at the end.

These athletes were striving to win games and races, but were reduced to efforts just to finish. All five participants reported not trusting their bodies, because they did not know when their bodies would fail them. They stated that they were mentally prepared and ready, but were physically held back. They also reported feeling perpetually out of shape. One athlete stated, “I’ve been like this for so long that I’ve forgotten what it feels like to be in shape the way I used to be.” It appeared that the lack of accomplishment chipped away at their confidence.

**Questioning Athletic Identity.** Due to the reduced accomplishment in practice and competition, three of the five athletes started to wonder if they still fit their conceptualization of what a real athlete is. One athlete said, “I’ve spent all this time and effort my whole life so I would say I’m an athlete, but [I look at what I do and] I guess not.” Another athlete took the entire summer season off and focused on other strengths, such as dance and modeling. She said she enjoyed spending time on the other activities, but she was really ready to go back to swimming. Swimming appears to remain her main identity.

**Onset or Worsening Mood.** Four of the five athletes in this study reported that they experienced clinical levels of depression and/or anxiety, as diagnosed by a mental health counselor or a psychologist. It is unclear whether mood changes occurred before the onset of VCD, concurrently, or afterward. This issue was explored during interviews.

Three of the five athletes reported depressive symptoms before VCD, though only one had a mental health professional verify clinical depression before VCD diagnosis. (She had endured “extreme family stress” as a consequence of Hurricane
Katrina.) The other two athletes guessed, in retrospect, that their depression occurred before the VCD, but neither was sure of the exact onset of her VCD. One of these athletes was severely depressed, reporting an “overdose” (i.e., an attempt at suicide) that occurred about the time she believes VCD symptoms started. She also reported the experience of VCD initiated her decline back into “a really deep depression” a year later.

One athlete mentioned high levels of anxiety around the time of the VCD onset, because she was trying to make her junior national qualifying time and “felt lot of pressure.” She had a few VCD attacks and then, according to her mother, “she went downhill, and it devastated her.” “I was mess; I’m just really hard on myself,” the athlete said. In this case, high levels of anxiety were seen by the participant as being associated with onset, and then the experience of VCD was seen as being associated with depression. Of note, the anxiety in this case was reported as sport-specific and may or may not have reached clinical levels.

**Determination.** According to all five participants, not being able to keep up with teammates or not being able to meet or hold their own standards led to feelings described as frustration or aggravation. These feelings were classified as having a reduced sense of accomplishment. However, in spite of waning levels of confidence, these athletes also expressed increased resolve to excel in practice or competition. The frustration was expressed much like anger, and it was always followed with a statement of determination. One athlete said, “It gets to the point where I get so aggrieved that whatever I’m aggrieved with, I do it more.” Each of the three swimmers reported pushing themselves until being forced to stop. One said, “I never stop. How do I put this—I have to be forced to stop. I have to be dragged out of the pool, or else I’ll keep going.” All five athletes said they keep going until a coach or the symptoms prevent them. One athlete said she fainted twice during practice before stopping.

**Denial and Lack of Fear.** These athletes tended to ‘forget’ that they have a breathing problem, or simply relegated it to the back of their minds in favor of pursuing their goals with 100% effort. The mother of a swimmer reported that her daughter becomes frustrated, but does not seem to let it create doubt, denying there is any reason why she should stop. Her mother described the exchange as, “[My daughter] said, ‘I’m going a 56 in my 100 back as soon as I get back, and I don’t care if I pass out.’ She doesn’t care! I said, ‘No way, I don’t care how fast you go, but swim it and get out of the water.’ And she said, ‘Nope. I’m going a 56.’ She has that cocky, type A personality, you know? She says, ‘I’m gonna prove it to everyone!’ There is no stopping her!” All five athletes admitted to frustration related to having a breathing dysfunction. They admitted to how VCD hindered their performance in the past, but they denied the possibility that it would affect them in the future.

**Unfairness.** The experience of unfairness appears to be a response to the reality of a physical dysfunction which athletes with VCD have to deal with on a consistent basis. It is the question of “Why me?” At some point in the interview, though never dwelling on it and always following it up with some expression of resolve, two of the five athletes wondered why they had to suffer. One swimmer stated that she has little tolerance for excuses from teammates because they are better off than she is, and she does not make excuses.
Discussion

This was an initial exploratory study aimed at investigating psychological facets associated with exercise-induced VCD in competitive athletes. In all, from interview data with five competitive female athletes, ten facets emerged: (1) physical exhaustion, (2) emotional exhaustion, (3) devaluing sport, (4) feelings of isolation, (5) reduced accomplishment and confidence, (6) questioning athletic identity, (7) onset or worsening mood, (8) determination, (9) denial and lack of fear, and (10) unfairness. Notably, the first 5 of the 10 facets appear to coincide with burnout symptoms. Derived from themes in health-care settings (Maslach, 1982), burnout in sport has been conceptualized as an enduring or chronic experiential state characterized by physical and emotional exhaustion, sport devaluation, and a perception of inadequate personal accomplishment (Raedeke & Smith, 2001). Athletes with VCD in the current study reported physical exhaustion, emotional exhaustion, sport devaluation, and reduced accomplishment and confidence, thus showing signs similar to those at high risk for burnout. However, the athletes’ behaviors do not appear indicative of burnout.

Specifically, the athletes also reported high levels of determination and denial that the breathing difficulty would affect a particular upcoming race. Taken together, these athletes seem highly motivated and unwilling to let VCD be an excuse, thereby not fitting the profile for burnout. This may help explain why the athletes persist with their sport despite symptoms of burnout. That said, one of the participants, in the follow-up interview, revealed she had just quit her sport due to no other reason than the VCD.

The athletes in the current study experienced physical exhaustion beyond that which is normally experienced in their sport. They became physically unable to complete all practices, but nevertheless said they approach each one with determination (even denial of having a problem). Lack of reaching their goals in practice and competition seemed to lead to reduced joy in their sport (a component of sport devaluation), and a reduced sense of accomplishment. They wondered if the hard work was worth it. When reflecting on past difficulties due to VCD, they expressed lower confidence or self-efficacy in their ability to perform well in the future. However, though frustrated due to feeling betrayed by their body even though they stated that they were mentally prepared, the athletes generally expressed confidence in future performance and denial that VCD would affect it. Perhaps the athletes fluctuate between high and low self-efficacy in their future performance depending on the situation, whether it is in reflection of past events or goal-setting for future competition.

Raedeke and Smith (2001) found that low social support coupled with low coping resources resulted in a greater chance for burnout. As indicated in this study, the athletes reported feelings of isolation when no one seemed to understand their predicament. Furthermore, medical professionals were often not familiar with the dysfunction, leaving the athlete and her parents without feelings of validation or a viable explanation. After breathing episodes during practices and competitions, the athletes said they felt they had to defend the reality of their breathing difficulty.

Research on patients with VCD has associated this condition with high levels of stress, anxiety, and depression (Dietrich et al., 2008). The results of the current study affirm this association, with four of the five athletes experiencing high
levels of these symptoms. However, it is inconclusive whether the stress, anxiety, or depressive symptoms occurred before onset, concurrently, or as a consequence of breathing difficulties.

Parallel with previous research, athletes in this study were high-achievers; they showed determination in spite of negative states and feelings, but stated that due to VCD, they were unable to push themselves to the levels they were able to when not having an episode. Not being able to “get turnover” or “pass the pain barrier” caused frustration. When attacks occurred, if not stopped due to collapsing or fainting, they reported having to be forced to stop by their coaches. These behaviors appear contrary to malingering.

The soccer player said she could manage the VCD better in high school than in college because the game was slower, and now she can run long, slow paced runs without a problem, but has attacks when she sprints. The athletes’ description of strong achievement drive and heavy workload suggests that high-stress loads, whether emotional or physical, might be a trigger for VCD, but further research is needed to affirm or reject this notion.

Implications

Because seven of the facets appear to match current conceptualizations of burnout, athletes with VCD might benefit from burnout assessment and intervention, if needed. Assessment might be warranted even if there are no overt burnout symptoms; three of the facets might protect them from actually quitting or showing readily observable signs of burnout. All five participants in the current study never expressed frustration without following it with a statement of determination to do well in spite of VCD. According to self-report, this determination was behaviorally expressed in refusing to stop until their coaches insisted. Interviews with the mother confirmed this behavior. Recommendations to quit the sport appear likely be met with resistance. However, findings of how to manage burnout in the extant literature may have some success with managing VCD in athletes, or at least with easing the negative experience these athletes experience.

Three of the five athletes indicated that some of their emotional exhaustion and feelings of isolation stemmed from feeling a constant pressure to defend or explain VCD and from the lack of social support from teammates, coaches, or athletic trainers. Increasing social support through a better understanding and willingness to listen to these athletes may help them emotionally. Education for teammates, coaches, and other sport personnel on the characteristics and behavioral consequences of VCD may be helpful. Newsham et al. (2002) reported that athletes with VCD tend to have a desire to please others. It might be important for the psychological health of an athlete with VCD to have those people significant to her show understanding.

Thus far, the most frequent recommendation for treatment is for patients with VCD to seek speech therapy (Doshi & Weinberger, 2006; Mathers-Schmidt, 2001; Pope & Koenig, 2005). As illustrated through case studies, the success of speech therapy has mixed results with some indicating success (Mathers-Schmidt) and others indicating little support for this treatment (Weinberger & Abu-Hasan, 2009). The three athletes in this study who attempted speech therapy reported minimal improvement, and the swimmers reported the techniques do not work.
with the special requirements of breathing during their sport. As the varied nature of the etiology is realized, perhaps a multidisciplinary approach would be helpful (Weinberger & Abu-Hasan, 2009).

Due to the correlation of mood disorders and VCD, a few studies recommended addressing psychological factors (Mathers-Schmidt, 2001; Rhodes, 2008; Smith, 1988). This study is unique in that it investigates in the small sample a few psychological facets or characteristics of experiencing VCD, and not just the mere correlation of psychological disorders and VCD.

Limitations and Future Research

There were several limitations in this research. First, the very small sample size makes our conclusions preliminary and inconclusive. The current exploratory study consisted of five cases, and therefore, the findings, as obtained here, cannot generalize to all athletes with vocal cord dysfunction. Moreover, all five athletes were females; males may respond differently to VCD. Secondly, these athletes were referred by coaches, counselors, and sport psychology consultants who coached them and were aware of their diagnosis. Athletes who do not seek the help of these personnel may have a different psychological experience. Notably, each athlete referred to us also consented to participation. The small size is due to the small number of referrals, not because of refusal to participate. A third limitation is the reliance on first-person data over the telephone. While telephone interviews may have provided a sense of anonymity and allowed more freedom in sharing, there also was a potential for social desirability bias. Furthermore, phone interviews precluded incorporating nonverbal clues into the data collected, and thus precluded considering separate behavioral data as confirmation of reported information. Finally, although the mothers’ reports confirmed the daughters’ descriptions, there is a possibility that the mothers held a particular bias to protect their daughters.

Future research could incorporate behavioral observations; it also could investigate the psychological facets of males with VCD, coping resources of athletes with VCD, and the efficacy of different ideas for management of symptoms. Validated burnout questionnaires could be used to confirm if burnout is, in fact, a risk in this population. More research on prevention and management of VCD is needed.

Conclusion

Athletes with VCD are special cases because the breathing dysfunction poses threat to their participation and performance in sport. The lack of efficacious treatment means athletes may struggle with VCD indefinitely. It is important for sport personnel to familiarize themselves with such breathing dysfunction and its associated psychological symptoms. Better understanding of the athletes’ experiences can bolster support for management and recovery. This study’s method aimed at describing the athletes’ VCD experiences through semistructured interviews. The common psychological experiences these athletes reported were: (1) physical exhaustion, (2) emotional exhaustion, (3) devaluing sport, (4) feelings of isolation, (5) reduced accomplishment and confidence, (6) questioning athletic identity, (7) onset or worsening mood, (8) determination, (9) denial and lack of fear, and (10)
unfairness. The first seven facets suggest that these athletes are potentially at risk for developing burnout; burnout assessment with athletes who have VCD may be warranted. The facets identified are a starting point for sport personnel to plan their treatment and support of athletes in their care.

Acknowledgments

The authors wish to thank Robyn Braun for her role as an independent coder of the data in this study.

References


