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Emilie Pété, Chloé Leprince, Noémie Lienhart, Julie Doron. Dealing with the impact of the COVID-19 outbreak: Are some athletes' coping profiles more adaptive than others?. *European Journal of Sport Science*, 2021, pp.1-11. 10.1080/17461391.2021.1873422 . hal-03298320

HAL Id: hal-03298320

<https://hal.science/hal-03298320>

Submitted on 4 May 2024

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To cite this article: Emilie Pété, Chloé Leprince, Noémie Lienhart & Julie Doron (2022) Dealing with the impact of the COVID-19 outbreak: Are some athletes' coping profiles more adaptive than others?, European Journal of Sport Science, 22:2, 237-247, DOI: [10.1080/17461391.2021.1873422](https://doi.org/10.1080/17461391.2021.1873422)

To link to this article: <https://doi.org/10.1080/17461391.2021.1873422>



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ORIGINAL RESEARCH



Dealing with the impact of the COVID-19 outbreak: Are some athletes' coping profiles more adaptive than others?

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ABSTRACT

The public health policies and sanitary measures taken by governments in various countries to stem the spread of the COVID-19 pandemic (e.g. lockdown, social distancing) have major implications for athletes. The radical changes are challenging and risk causing significant career disruption to athletes, with subsequent negative psychological effects. Thus, the ways athletes cope with such adversity is of critical importance. The present study aimed to identify athletes' coping profiles using a person-centred approach, based on their reported use of multiple coping strategies in response to the impact of the COVID-19 outbreak, and to compare levels of anxiety, stress appraisals, interpersonal coping strategies, and availability and appreciation of the major sources of support across profiles. A total of 526 French athletes competing at national to elite levels answered an online questionnaire during the lockdown. Latent profile analysis results yielded four distinct coping profiles (i.e. self-reliant, engaged, avoidant, active and social). The MANOVA showed that athletes belonging to the four profiles differed on anxiety, stress appraisals, social support, and interpersonal coping. In particular, avoidant copers reported high levels of anxiety, threat, and uncontrollability, and appeared less able to regulate responses to the impact of the COVID-19 outbreak. Using a person-centred approach, the findings could inform the development of more adequate care, support, and intervention for athletes, especially avoidant copers, who were characterized by the least effective coping skills and resources. Accordingly, stress reappraisal and stress mindset interventions could be promising approaches to effectively manage pandemic-related impact during and after the COVID-19 crisis.

KEYWORDS

coping profiles; anxiety; stress appraisals; interpersonal coping; social support; competitive athletes

Highlights

- The COVID-19 outbreak has major implications for athletes and is causing significant disruption to their careers. Using a person-centred approach, four coping profiles emerge showing athletes' preferred use of several coping strategies in response.
- The four coping profiles (i.e. self-reliant, engaged, avoidant, active and social) differentiate distinct groups of athletes in relation to anxiety, stress appraisals, social support, and interpersonal coping.
- Avoidant copers were characterized by the least effective coping skills and social context of coping. Management of the COVID-19 situation may be more problematic for them than other in mitigating its negative psychological effects.
- Using a person-centred approach, the findings could inform the development of more adequate care, support, and intervention for athletes, especially avoidant copers, who were characterized by the least effective coping skills and resources.

Introduction

On 30 January 2020, the World Health Organization declared COVID-19 to be a pandemic and a public health emergency of international concern. The sport community entered an extreme and hitherto unknown situation. Major local and international competitions, such as the European Football Championship and the

Tokyo 2020 Olympic and Paralympic Games were cancelled or postponed. Public health policies and sanitary measures taken by governments to stem the spread of the COVID-19 pandemic (e.g. lockdown, social distancing) have major implications for athletes. They include career and performance-related goal disruption, qualification process uncertainty, unconventional and limited

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access to training facilities and training partners, and social isolation (Schinke et al., 2020). These radical changes and the collateral consequences of the pandemic present significant challenges for the sport community (Clemente-Suárez, Fuentes-García, de la Vega Marcos, & Martínez Patiño, 2020; Samuel, Tenenbaum, & Galily, 2020; Taku & Arai, 2020). By exposing athletes to stressful experiences, they represent a risk factor for athletes' well-being and health (di Fronso et al., 2020; Timpka, 2020).

Coping with an unprecedented stressful situation

In pursuit of excellence, elite athletes and aspiring performers routinely deal with high physical and psychological demands related to training and competition, as well as a wide range of stressors (e.g. errors, performance issues, fatigue, organizational climate) requiring effective coping skills (Arnold & Fletcher, 2012; Crocker, Tamminen, & Gaudreau, 2015). Athletes generally appraise these demands in terms of personal meaning based on what is at stake in respect of their goals, commitments, and values (i.e. primary appraisal), and what "might" or "can" be done to deal with them (i.e. secondary appraisal; Lazarus, 1999). Six stress appraisal dimensions can be distinguished: threat, challenge, centrality, controllable-by-self, controllable-by-others, and uncontrollable-by-anyone (Peacock & Wong, 1990). In the adaptation process linked to stressful events, stress appraisal plays a central role in determining whether individuals' responses are adaptive and lead to effective coping, or maladaptive and lead to ineffective coping and compromised well-being and health (Hagger, Keech, & Hamilton, 2020). With the COVID-19 outbreak, however, athletes face unprecedented and unknown situations with increased risk of exposure to multiple stressors (Clemente-Suárez et al., 2020; Schinke et al., 2020; Taku & Arai, 2020). After such intense focus on crucial high-performance goals, the uncertainty and lack of career direction may harm athletes (Samuel et al., 2020). To date, research on career disruption in sport has only investigated the potential negative psychological and social effects of injury or retirement (Stambulova, Ryba, & Henriksen, 2020; Wylleman, Alfermann, & Lavalée, 2004). The COVID-19 outbreak risks causing significant and as yet unidentified career disruption that may expose athletes to stressful experiences and have negative effects on their well-being and health. Better understanding of how athletes appraise and manage COVID-19 outbreak-related demands is therefore important and particularly so in light of the exceptional nature and potential psychological effects.

Coping skills and social resources for dealing effectively with the COVID-19 outbreak

Coping is of critical importance in mitigating the adverse effects of pandemic-related stressors (e.g. social isolation, infection fears, inadequate information, financial loss; Chew, Wei, Vasoo, Chua, & Sim, 2020; Lee-Baggley, DeLongis, Voorhoeave, & Greenglass, 2004; Main, Zhou, Ma, Luecken, & Liu, 2011; Polizzi, Perry, & Lynn, 2020; Umucu & Lee, 2020), and the psychological costs of sanitary measures (e.g. depression, emotional disturbance; Brooks et al., 2020; Qiu et al., 2020; Rubin & Wessely, 2020). Coping is a multidimensional construct that encompasses cognitive, emotional, and behavioural regulatory processes to manage the specific demands encountered during a stressful situation (Lazarus, 1999). Based on their adaptive functions, coping strategies can be regrouped in meaningful and parsimonious higher-order dimensions of coping (Nicholls, Taylor, Carroll, & Perry, 2016). In this regard, Nicholls et al. (2016) have proposed a comprehensive classification of coping consisting of: (1) mastery coping, which includes strategies that involve athletes attempting to take control of a stressful situation and thus eliminate the stressor (e.g. task-oriented coping, problem-focused coping), (2) internal regulation coping, which involves athletes attempting to manage internal responses to stress (e.g. emotion-focused coping, acceptance), and (3) goal withdrawal coping, which refers to athletes ceasing their efforts to achieve a goal (e.g. disengagement-oriented coping). Certain types of coping strategies are viewed as more adaptive than others through their ability to reduce or amplify the effects of stressful situations on well-being and health (Penley, Tomaka, & Wiebe, 2002; Skinner, Edge, Altman, & Sherwood, 2003). In the particular context of pandemics, some coping responses (e.g. self-care, daily routines) appear to protect better than others against psychological distress among the general population (Chew et al., 2020; Dawson & Golijani-Moghaddam, 2020; Fullana, Hidalgo-Mazzei, Vieta, & Radua, 2020; Main et al., 2011). However, little is known about coping strategies used specifically by competitive athletes to cope with the impact of the COVID-19 outbreak, as well as their effectiveness in mitigating its potential psychological effects.

Athletes have reported that being in contact via the internet with coaches or other professionals helps them to cope with stress during lockdowns (di Fronso et al., 2020). Previous research emphasized that the presence of significant others (e.g. coaches, members of the staff, teammates, training partners, parents) can influence coping resources and psychological

adjustment in the context of sport and performance (e.g. coach-athlete dyadic coping; Staff, Didymus, & Backhouse, 2017, 2020; coping within teams; Kerdijk, van der Kamp, & Polman, 2016), in healthy and clinical populations (e.g. social support; DeLongis & Holtzman, 2005), or in the context of traumatic events or natural disasters (e.g. communal coping; Wlodarczyk et al., 2016). The process in which people appraise stressful events and act upon them in the context of close relationships (i.e. dyad, small group, team) refers to the interpersonal nature of coping (Lyons, Mickelson, Sullivan, & Coyne, 1998). It describes the way people jointly engage in collective efforts and cooperative actions to manage stressful circumstances (e.g. communal coping; Leprince, d'Arripe-Longueville, Chanal, & Doron, 2019; Lyons et al., 1998; or dyadic coping; Staff, Didymus, & Backhouse, 2020). In order to appropriately differentiate communal or dyadic coping from other forms of social support, researchers have recently proposed that social support be viewed as the unidirectional provision of support, and dyadic or communal coping as bidirectional support within interpersonal relationships (Staff et al., 2017, 2020). The interpersonal processes related to athletes' coping, which have the potential to broaden the understanding of how athletes actually cope within the particular context of the COVID-19 outbreak, therefore deserve further consideration.

From coping strategies to coping profiles

The possibility that people may use more than one coping strategy when dealing with pandemic-related stressors has not previously been taken into account (Chew et al., 2020). In other contexts, some researchers have begun to examine coping strategies in terms of profiles using a person-centred approach rather than in isolation (Doron, Thomas-Ollivier, Vachon, & Fortes-Bourbousson, 2013, 2015; Gaudreau & Blondin, 2004; Herres, 2015). A person-centred approach is a method used for identifying and describing subgroups of individuals defined by similarities along multiple dimensions of interest (e.g. coping strategies). The process of involving a heterogeneous sample of individuals and forming relatively homogeneous groups serves to organize large quantities of multivariate information. This approach allows identification of the distinct ways individuals combine several coping strategies to deal with stressful events, and the extent to which the coping profiles are differently associated with psychological adjustment and health outcomes (e.g. Doron et al., 2013, 2015; Herres, 2015). In order to reach meaningful conclusions on the way athletes are coping with the impact of the COVID-19 outbreak, latent profile analysis (a statistical

person-centred methodology) may be a useful method for identifying coping profiles across multiple strategies and differentiating distinct groups of athletes in relation to stress appraisals and targeted health-related outcomes. It may also be informative to examine the extent to which athletes' coping profiles are associated with different levels of social support and interpersonal coping. This could enable targeting of athletes at risk of showing maladaptive coping profiles, and prevention of prejudicial psychological effects in the context of the COVID-19 outbreak.

The present study

Using a person-centred approach (i.e. latent profile analysis), the present study aimed to identify athletes' coping profiles based on their reported use of multiple coping strategies in response to the COVID-19 outbreak, and compare levels of anxiety, stress appraisals, interpersonal coping strategies, and availability and appreciation of the major sources of support across coping profiles.

Methods

Participants

A total of 526 French athletes (271 women, 255 men; $M_{\text{age}} = 21.87$ years; $SD = 8.66$) playing team (10.6%: football, handball, volleyball, basketball, rugby, artistic swimming, water polo, rink hockey), or individual (89.4%: judo, golf, rowing, shooting, skiing, swimming, fencing, cycling, skydiving, badminton, sailing, modern pentathlon, canoeing, athletics, table tennis, snowboard, dancing, triathlon, tennis, speed skating, gymnastics, water skiing, lifesaving, diving, motorcycling, kitesurfing, karate, climbing, riding, land sailing, boxing) sports voluntarily participated in the study. They were disabled (4.4%) or able-bodied (95.6%) athletes, involved in sports for an average of 12.58 years ($SD = 6.61$) and who had played top-level sport for an average of 4.83 years ($SD = 4.24$). The sample consisted of athletes competing at national (46.2%), international (35.6%), or elite level (18.3%) (for a definition of these levels, see Swann, Moran, & Piggott, 2015). Regarding the Tokyo Olympic and Paralympic Games, athletes had already qualified (2.9%), were in the process of qualifying (9.1%), had not qualified (16.0%), or were not concerned (72.0%).

Procedure

Data were collected during the lockdown through an online questionnaire distributed to French athletes by

coaches, sports federations, and institutes, and circulated on social networks (Facebook, Twitter). All Internet links firstly took potential participants to an informed consent page, meeting the criteria of free participation, anonymity, and confidentiality of the responses. The questionnaire itself took approximately 15 min to complete. Data were gathered between 30 March and 26 April 2020, corresponding to initial lockdown periods of between 14 and 41 days. The protocol was approved by a local ethics committee (CERNI- Comité d'Éthique de la Recherche Non Interventionnelle, France. Ref. 08042020).

Measures

State anxiety

Participants subjectively indicated “how anxious they currently feel in relation to the impact of the COVID-19 outbreak”. Two single items were used to measure the intensity of anxiety and the directional interpretation of anxiety on a 6-point Likert scale ranging from 0 (*not at all*) to 5 (*extremely*) (Jones & Swain, 1992).

Stress appraisal

An adapted and abridged version of the Stress Appraisal Measure (Peacock & Wong, 1990) was used to assess three primary appraisals (challenge, threat, centrality), three secondary appraisals (controllable-by-self, controllable-by-others, uncontrollable-by-anyone), and stressfulness (overall feeling of stress). For each single-item measure of stress appraisal, participants indicated how they viewed various aspects relating to the impact of the COVID-19 outbreak “right now” on a 6-point Likert scale ranging from 0 (*not at all*) to 5 (*extremely*).

Individual coping

The 28-item Brief COPE (Doron et al., 2014) was used to assess “how athletes are coping with the impact of the COVID-19 outbreak”. Fourteen coping strategies were measured and regrouped in five coping dimensions including: avoidance (behavioural disengagement, self-blame, denial, substance use), cognitive restructuring (acceptance, humour, positive reframing), problem solving (planning, active coping), distraction (self-distraction, venting), and support seeking (instrumental support, emotional support, religion). Participants reported to what extent they currently used each of the strategies described when dealing with the COVID-19 situation, on a 6-point Likert scale ranging from 0 (*not at all*) to 5 (*very strongly*).

Availability and satisfaction of major sources of support

Participants completed an adapted version of the social support scale for the professional domain (Collange, Bellighausen, Emery, Albert, & Zenasni, 2015). This assessed, through single-item measurement on a 6-point Likert scale, the availability, ranging from 0 (*not at all*) to 5 (*extremely*), and the satisfaction, ranging from 0 (*very unsatisfactory*) to 5 (*very satisfactory*), of each major source of support (i.e. sport federation, coach, psychologist, teammates, family, friends).

Interpersonal coping

Using a definitional approach (Ptacek, Smith, Espe, & Raffety, 1994), the Communal Coping Strategies Inventory for Competitive Team Sports (Leprince et al., 2019) was adapted to measure four communal coping dimensions: problem-oriented communal efforts (problem solving, increasing efforts), communal management of emotions (reassurance, interpersonal regulation of negative emotions), communal goal withdrawal (venting emotions, disengagement), and relationship-oriented coping (motivational support, social joining). Participants reported to what extent they (themselves and their training partners or teammates) currently used communal coping to manage the impact of the COVID-19 situation together, on a 6-point Likert scale ranging from 0 (*not at all*) to 5 (*very strongly*).

Data analysis

Firstly, a latent profile analysis (LPA) approach was used to identify the athletes' coping profiles. A series of measurement models (from one to six classes) was conducted with Mplus Version 7.3 to select the model that most accurately captured the coping profiles. Since no single statistical indicator provided evidence for a good model fit, several indicators were used: Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Adjusted BIC (ABIC), and bootstrap likelihood ratio test (LRT). The smallest values of AIC, BIC, and ABIC provided evidence for the best-fitting model. A significant p -value suggested that the $k-1$ class model should be rejected in favour of a k class model. Secondly, three multivariate analyses of variance (MANOVAs) were performed with SPSS Version 20 to explore whether athletes with different coping profiles differed on: (a) anxiety and stress appraisals; (b) availability and satisfaction of sources of support; and (c) interpersonal coping strategies. When a multivariate effect was significant ($p < .05$), *post hoc* comparisons of group means were carried out.

Results

Athletes' coping profiles

Based on the results in Table 1, the 4-class model fitted best. There were sharp decreases for the AIC, BIC, and ABIC values between 1- and 2-class models and between 3- and 4-class models. The LRT also suggested that the 4-class model fitted significantly better than the 3-class model, but the 5-class model did not fit significantly better than the 4-class model. Based on both the interpretability of the coping profiles and the LPA indicators, a 4-class solution was selected (Figure 1). Based on the varying degrees of different coping strategy use across the coping profiles presented in Figure 1, they were labelled: (1) self-reliant copers; (2) engaged copers; (3) avoidant copers; and (4) active and social copers. Athletes within each coping profile

reported their preference for certain coping strategies. Self-reliant copers ($n = 112$) displayed moderate levels of cognitive restructuring (acceptance, humour, positive reframing) and distraction (self-distraction, venting). Engaged copers ($n = 190$) reported high levels of cognitive restructuring and problem solving (planning, active coping), as well as moderate levels of distraction. Active and social copers ($n = 148$) endorsed high levels of cognitive restructuring, problem solving, and distraction, as well as moderate levels of support seeking (instrumental support, emotional support, religion). Avoidant copers ($n = 76$) reported higher levels of avoidance (behavioural disengagement, self-blame, denial, substance use) compared to the other three coping profiles. They also displayed moderate levels of cognitive restructuring, problem solving, and distraction. The demographic

Table 1. Fit indices for the latent profile analysis models with 1–6 classes.

No. of classes	1	2	3	4	5	6
No. of free parameters	10	16	22	28	34	40
Log likelihood	−3175.3	−3070.7	−3027.1	−2980.7	−2947.6	−2927.9
AIC	6370.6	6173.5	6098.1	6017.4	5963.1	5935.8
BIC	6413.2	6241.7	6191.9	6136.8	6108.1	6106.4
ABIC	6381.5	6190.9	6122.1	6048.0	6000.2	5979.4
LRT	NA ^a	209.1***	87.4*	92.7*	66.3	39.3

^aLRT not available for the 1e-class model; *** $p < .001$; * $p < .05$. Notes: AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; ABIC = Adjusted BIC; LRT = Bootstrap Likelihood Ratio Test; The numbers in bold represent the selected model.

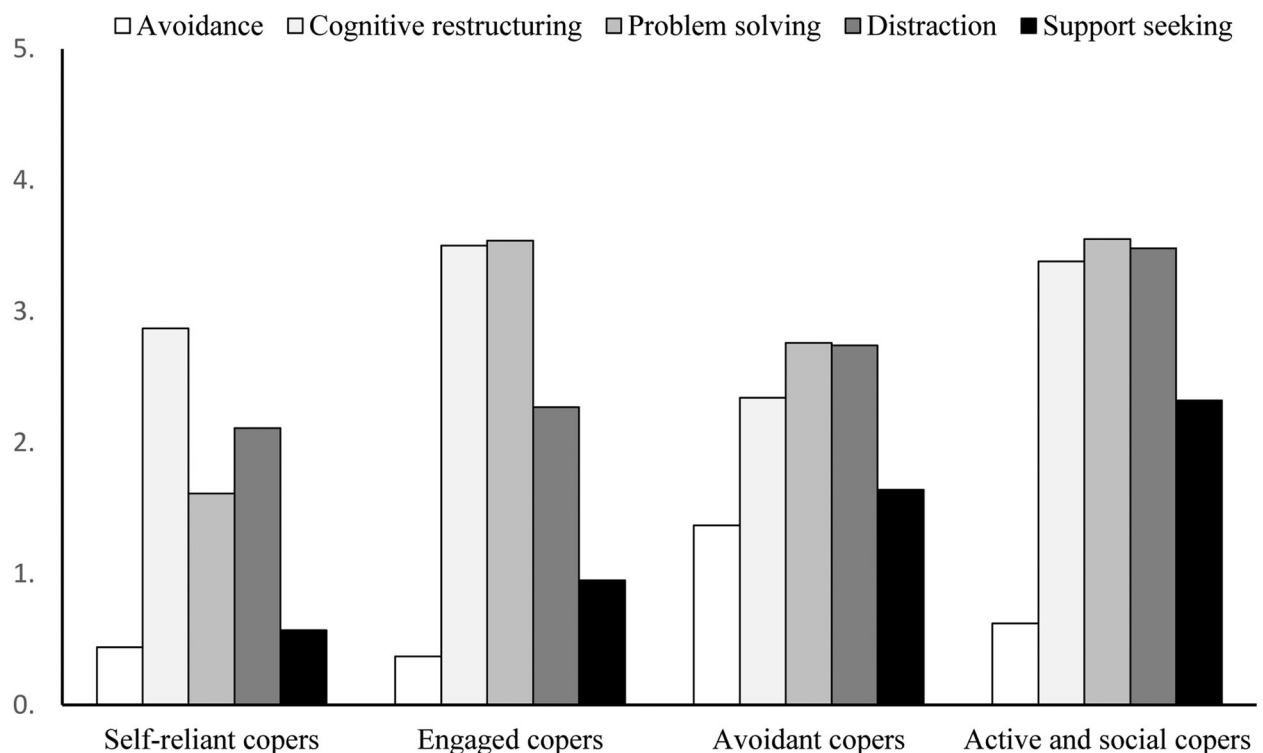


Figure 1. Estimate of athletes' coping profiles for LPA model. Athletes were asked to what extent they engaged in various coping strategies when dealing with the impact of the COVID-19. The scale ranged from 0 = not at all to 5 = very strongly.

Table 2. Demographic characteristics of the coping profiles.

	Self-reliant copers (<i>n</i> = 112)	Engaged copers (<i>n</i> = 190)	Avoidant copers (<i>n</i> = 76)	Active and social copers (<i>n</i> = 148)
Age (<i>M</i> , <i>SD</i>)	21.2 (6.5)	22.5 (8.1)	22.1 (9.4)	21.5 (7.3)
Years of practice (<i>M</i> , <i>SD</i>)	12.2 (5.2)	13.1 (6.6)	12.3 (6.3)	12.4 (5.7)
Years of high level practice (<i>M</i> , <i>SD</i>)	4.4 (3.6)	5.6 (4.7)	4.5 (3.7)	5.3 (4.1)
Gender				
Men (%)	58.0	52.1	43.4	39.2
Women (%)	42.0	47.9	56.6	60.8
Able-bodied athletes (%)	98.2	94.2	97.4	94.6
Disabled athletes (%)	1.8	5.8	2.6	5.4
Type of sport				
Individual sports (%)	89.3	88.9	89.5	89.9
Team sports (%)	10.7	11.1	10.5	10.1
Level of competition				
Elite (%)	11.6	23.2	11.8	20.3
International (%)	33.0	38.9	31.6	35.1
National (%)	55.4	37.9	56.6	44.6
Olympic and Paralympic Games				
Qualified (%)	3.6	2.1	0.0	4.7
Qualification in progress (%)	8.0	10.5	11.8	6.8
Not qualified (%)	10.7	16.8	13.2	20.3
Not concerned (%)	77.7	70.5	75.0	68.2

characteristics of athletes belonging to the four coping profiles are presented in Table 2.

Coping profile differences on anxiety and stress appraisals, availability and satisfaction of sources of support, and interpersonal coping strategies

The results of the three MANOVAs were significant (see Table 3). Athletes belonging to the four profiles differed on anxiety and stress appraisals ($F_{(24, 515)} = 7.8$; $p = .00$; Partial $\eta^2 = .11$; $\lambda = .3$), availability and satisfaction of support sources ($F_{(36, 510)} = 2.4$; $p = .00$; Partial $\eta^2 = .05$; $\lambda = .9$), and interpersonal coping ($F_{(12, 518)} = 4.1$; $p = .00$; Partial $\eta^2 = .03$; $\lambda = .9$). In particular, avoidant copers reported significantly higher anxiety and appraised the impact of the COVID-19 outbreak as more threatening, uncontrollable, and with more significant consequences than the other three profiles. They perceived significantly lower availabilities and satisfaction of major sources of support than the other three profiles. They (themselves and their training partners or teammates) exhibited more disengagement-oriented interpersonal coping

strategies than the other three profiles. The results of the MANOVAs and *post hoc* comparisons are detailed in Table 3.

Discussion

Rather than examining a single type of coping strategy, the present study identified coping profiles of competitive athletes using a person-centred approach. To date, the literature on current and past pandemics has principally investigated the bivariate relationships between coping responses to pandemic-related stressors and people's well-being and health in the general population (for a review, see Chew et al., 2020). Such an approach has neglected the multidimensional nature of coping (Nicholls et al., 2016) and the possibility that people may combine several coping strategies when dealing with stressful situations (Doron et al., 2013, 2015; Gaudreau & Blondin, 2004; Herres, 2015). Furthermore, the COVID-19 outbreak has major implications for sport performers (Samuel et al., 2020; Schinke et al., 2020; Taku & Arai, 2020; Timpka, 2020). However, little is known about how competitive athletes specifically manage this new and challenging situation, or its psychological effects. The results of LPA yielded four distinct coping profiles (i.e. self-reliant, engaged, avoidant, active and social), and highlighted athletes' preference for certain strategies within each profile (see Figure 1). These findings strengthened previous research by indicating the different ways in which competitive athletes combined several coping strategies in response to the impact of the COVID-19 outbreak (di Fronso et al., 2020). These findings also provided further insight into the coping profiles of athletes when facing an unprecedented and unknown stressful situation, i.e. a different context from normal sport competition (Gaudreau & Blondin, 2004).

Athletes' coping profile differences in response to the COVID-19 outbreak

The second research aim of the present study was to investigate whether athletes' coping profiles differ significantly in terms of anxiety, stress appraisals, social support, and interpersonal coping. Firstly, the "engaged" profile (i.e. high levels of cognitive restructuring and problem solving, moderate levels of distraction), and "active and social" profile (i.e. high levels of cognitive restructuring, problem solving, and distraction, moderate levels of support seeking) were associated with low to moderate levels of anxiety (intensity and directional interpretation), the most adaptive stress appraisals (controllability and challenge), and protective social environment

Table 3. Comparison of the four coping profiles on stress appraisal, perceived availability and satisfaction of sources of support, and interpersonal coping.

	Self-reliant copers (1) <i>M</i> (SD)	Engaged copers (2) <i>M</i> (SD)	Avoidant copers (3) <i>M</i> (SD)	Active and social copers (4) <i>M</i> (SD)	<i>F</i> - value	Partial η^2	Tukey's HSD
<i>Stress appraisal</i>					$F_{(24, 515)} = 7.8; p = .00; \text{Partial } \eta^2 = .11; \lambda = .3$		
Anxiety intensity	1.5 (1.0)	1.7 (1.1)	2.6 (1.1)	2.1 (1.1)	22.5**	.11	3 > 1, 2, 4; 4 > 1, 2
Anxiety direction	2.6 (1.2)	2.5 (1.2)	3.2 (1.1)	2.6 (1.3)	7.0**	.04	3 > 1, 2, 4
Centrality	2.2 (1.4)	2.4 (1.5)	3.1 (1.3)	2.9 (1.4)	11.0**	.06	3, 4 > 1, 2
Uncontrollable	2.2 (1.6)	2.0 (1.6)	3.0 (1.4)	2.8 (1.6)	10.8**	.06	3, 4 > 1, 2
Threat	1.2 (1.2)	0.9 (1.0)	2.2 (1.2)	1.4 (1.2)	25.2**	.13	3 < 1, 2, 4; 2 < 1, 4
Controllable-by-others	3.6 (1.1)	4.0 (1.0)	3.1 (1.2)	3.8 (1.1)	13.8**	.07	3 > 1, 2, 4; 1 > 2
Challenge	2.5 (1.3)	3.3 (1.5)	2.7 (1.4)	3.3 (1.3)	10.3**	.06	3 < 2, 4; 1 < 2, 4
Controllable-by-self	3.6 (1.0)	4.1 (0.9)	3.0 (1.3)	3.9 (0.9)	26.7**	.13	3 < 1 < 4 < 2
<i>Perceived availability and satisfaction of sources of support</i>					$F_{(36, 510)} = 2.4; p = .00; \text{Partial } \eta^2 = .05; \lambda = .9$		
Availability of federation support	3.1 (1.4)	3.3 (1.3)	3.1 (1.5)	3.3 (1.3)	1.0	.01	–
Availability of coach support	3.6 (1.2)	4.0 (1.2)	3.4 (1.5)	3.9 (1.3)	5.4**	.03	3 < 1, 2, 4
Availability of psychologist support	1.6 (1.8)	2.3 (1.9)	1.7 (1.7)	2.5 (1.9)	6.4**	.04	3 < 4; 1 < 2, 4
Availability of teammate support	3.4 (1.2)	3.6 (1.4)	3.2 (1.4)	3.5 (1.5)	1.6	.01	–
Availability of family support	4.4 (0.9)	4.5 (0.8)	3.9 (1.1)	4.6 (0.8)	10.0**	.05	3 < 1, 2, 4
Availability of friend support	4.1 (1.1)	4.3 (0.9)	3.6 (1.4)	4.1 (1.2)	6.1*	.03	3 < 1, 2, 4
Satisfaction with federation support	3.3 (1.3)	3.5 (1.3)	2.9 (1.6)	3.4 (1.3)	3.5*	.02	3 < 2
Satisfaction with coach support	3.4 (1.3)	3.9 (1.1)	3.3 (1.5)	3.8 (1.4)	5.9**	.03	1, 3 < 2
Satisfaction with psychologist support	2.3 (1.7)	2.8 (1.8)	2.1 (1.8)	2.8 (1.8)	5.0*	.03	3 < 2, 4
Satisfaction with teammate support	3.5 (1.3)	3.8 (1.3)	3.3 (1.4)	3.6 (1.5)	2.7*	.02	3 < 2
Satisfaction with family support	4.3 (1.0)	4.5 (0.8)	3.8 (1.1)	4.5 (0.9)	11.1**	.06	3 < 1, 2, 4
Satisfaction with friend support	4.2 (1.0)	4.4 (0.8)	3.7 (1.3)	4.2 (1.2)	8.9**	.05	3 < 1, 2, 4
<i>Interpersonal coping</i>					$F_{(12, 518)} = 4.1; p = .00; \text{Partial } \eta^2 = .03; \lambda = .9$		
Problem-oriented	3.3 (1.5)	3.5 (1.6)	3.26 (1.6)	3.8 (1.5)	2.4	.01	–
Emotional-oriented	1.4 (1.5)	1.7 (1.6)	1.7 (1.5)	2.3 (1.7)	6.8**	.04	4 > 1, 2
Disengagement-oriented	0.6 (1.0)	0.4 (0.9)	1.0 (1.3)	0.7 (1.2)	7.1**	.04	3 > 1, 2; 4 > 2
Relationship-oriented	2.9 (1.6)	3.3 (1.6)	3.0 (1.5)	3.5 (1.5)	4.7*	.03	4 > 1

Notes: ** $p < .01$; * $p < .05$.

(interpersonal coping, social support). Engaged copers, as well as active and social copers, appraised the COVID-19 situation as more controllable and as a challenge. They also reported the greatest social support availability and satisfaction with this, and appeared the most inclined to engage in an adaptive interpersonal coping approach. The effectiveness of both these coping profiles in mitigating the impact of the COVID-19 outbreak may be explained by the combined use of high to moderate problem solving, cognitive restructuring, distraction, and support seeking, with low avoidance. Problem solving, cognitive restructuring, distraction, and support seeking are commonly viewed as effective while avoidance is viewed as ineffective in response to pandemic-related stress (Chew et al., 2020; Dawson & Golijani-Moghaddam, 2020; Fullana et al., 2020; Main et al., 2011). These results might also be due to the fact that both these coping profiles mainly constituted able-bodied and disabled athletes competing at the highest levels (international and elite) and with the greatest top-level sport expertise. This echoes di Fronso et al. (2020)'s study indicating that elite/expert athletes are

better able to cope with stressful and uncertain situations, and apply these skills in the context of the COVID-19 outbreak. Furthermore, the "active and social" profile comprised mainly women in comparison to "engaged" profile. The high proportion of women in this group is consistent with previous studies showing that women prefer to use high levels of several coping and support-seeking strategies when dealing with stress (Doron, Trouillet, Maneveau, Neveu, & Ninot, 2015; Herres, 2015). This may also explain why "active and social" copers are inclined to engage in interpersonal coping strategies when dealing with the impact of the COVID-19 outbreak, such as relationship maintenance and/or interpersonal emotion regulation (Lyons et al., 1998).

Secondly, the "self-reliant" profile (i.e. moderate levels of cognitive restructuring and distraction) also appeared to effectively manage the impact of the COVID-19 outbreak as indicated by its association with low levels of anxiety, adaptive stress appraisals (low threat, low centrality, low uncontrollability), and available and satisfactory social support. By preferentially using several cognitive coping strategies (acceptance, humour,

positive reframing, self-distraction), self-reliant copers are characterized by active attempts to accept the stress of the situation and change their view of it in order to see it in a more positive light (Skinner et al., 2003). Self-reliant copers may have gained self-empowerment in dealing with the COVID-19 outbreak through positively reinterpreting the impact of the situation and redefining their priorities in life (Chew et al., 2020). This may also explain why they are more self-centred and less oriented towards interpersonal coping. In short, each of the three aforementioned coping profiles, by way of different coping methods (combinations and repertoires of coping strategies), showed adaptive responses to the impact of the COVID-19 outbreak.

Thirdly, the “avoidant” profile (i.e. highest levels of avoidance, moderate levels of cognitive restructuring, problem solving, and distraction) deserves particular attention since avoidant copers were characterized by the least effective coping skills and social context of coping. Avoidant copers reported high levels of anxiety, threat, and uncontrollability appraisals, and appeared less able to regulate responses to stressful situations at individual and interpersonal levels. Management of the COVID-19 situation may be more problematic for avoidant copers than other in mitigating its negative psychological effects (Doron et al., 2013, 2015; Gaudreau & Blondin, 2004; Herres, 2015). As previously highlighted by Gaudreau and Blondin (2004), the use of avoidance in combination with coping strategies viewed as more adaptive, such as problem-solving, cognitive restructuring, and support seeking, may be more detrimental than the use of the latter alone (e.g. engaged copers, active and social copers). As behavioural disengagement, self-blame, denial, and substance use may outweigh the benefits of using strategies such as acceptance, planning, and support seeking, avoidant copers seem most at risk of developing psychological distress when dealing with the impact of the COVID-19 outbreak (Samuel et al., 2020; Schinke et al., 2020; Taku & Arai, 2020; Timpka, 2020).

The results of the present study as a whole expand the literature on pandemics by focusing specifically on coping strategies in terms of “profiles” and, in particular, within the population of competitive athletes (Chew et al., 2020). These findings add insight to previous research, which has started to examine the association between isolated coping strategies and psychological and psychosocial responses within sport performer populations during the COVID-19 outbreak (di Fronso et al., 2020; Samuel et al., 2020). These findings also address the lack of data or research findings concerning the psychological responses and the impact of such

stressful situations on athletes (Samuel et al., 2020). In this regard, the present study provides a deeper understanding of the different ways in which athletes are coping with the impact of the COVID-19 outbreak (combinations and repertoires of coping strategies) and to what extent the identified coping profiles (i.e. self-reliant, engaged, avoidant, active and social) are differently associated with anxiety, stress appraisals, social support, and interpersonal coping. The results show that avoidant copers’ responses are the most maladaptive and lead to ineffective coping, which compromises psychological adjustment to the impact of the COVID-19 outbreak. These findings may enable sport psychologists to design more effective interventions according to the specific needs of each coping profile in the particular context of the COVID-19 outbreak.

Practical implications

The first central practical implication of this study is the individualization of intervention based on the coping preferences of the athletes (i.e. self-reliant, engaged, avoidant, active and social). The respective coping skills of the three adaptive coping profiles (i.e. self-reliant, engaged, and active and social) need to be strengthened, while those of the maladaptive coping profile (i.e. avoidant) need to be improved. The results of the present study accordingly lead to identification of groups of athletes at risk of psychological distress who might benefit most from intervention (i.e. avoidant copers) during the COVID-19 outbreak. It may in fact be helpful to expand avoidant copers’ repertoires rather than trying to limit avoidance coping (Kaluza, 2000). Certain coping strategies, such as cognitive restructuring, problem solving, distraction, and support seeking, may be further developed while ensuring that avoidance strategies are not used at the same time. Based on the findings of the present study, stress reappraisal and stress mindset interventions could be promising stress management strategies to help avoidant copers foster their abilities to cope with pandemic-related stressors (Hagger et al., 2020). Stress reappraisal intervention involves prompting individuals to appraise stress as challenging and to be approached, rather than threatening and to be avoided. Stress mindsets involves highlighting the enhancing nature of stress. As outlined by Hagger et al. (2020), both of these strategies offer potentially successful, cost-effective ways of managing pandemic-related stress and minimizing negative consequences on well-being and health. They may therefore sustain change in coping profiles and promote adaptive responses to the impact of the COVID-19 outbreak. The second central practical

implication is to consider that social connections during difficult times may help athletes to regulate emotions, cope with stress, and remain resilient, even when there is physical distancing (di Fronso et al., 2020; Van Bavel et al., 2020). This may be valuable to active and social copers, but also to avoidant copers who do not benefit from a caring and supportive social environment (Staff et al., 2017, 2020).

Limitations

There are several limitations to this study that should be considered when interpreting the results. Firstly, to facilitate athletes' responses to the questionnaire, some variables were assessed using brief or single-item measures. The results could be expanded using complementary measures to better assess the coping responses and effects of the COVID-19 outbreak on athletes' well-being and health, such as psychobiosocial states, depression symptoms, or isolation. Secondly, reports were cross-sectional, limiting the ability to examine and discuss the influential or predictive nature of the variables. In order to better evaluate the adaptive nature of the different coping profiles, future research needs to longitudinally investigate the long-term cost-benefit of each coping profile (e.g. active and social copers) and their respective association with well-being and health indicators. Thirdly, the specificity of the stressors encountered by elite and professional athletes and their coping responses need to be better taken into account in investigating the impact of the COVID-19 outbreak on athletes' well-being and health (Toresdahl & Asif, 2020).

Conclusion

The COVID-19 outbreak has major implications for athletes and is causing significant disruption to their careers. The person-centred approach adopted in the present study allowed examination of athletes' distinct combinations of coping strategies in the specific context of the COVID-19 outbreak. Not only did different athletes have different coping profiles, but they varied in terms of anxiety, stress appraisals, social support, and interpersonal coping. A profile coping approach may provide researchers, sport psychology practitioners, and health professionals with a useful way of identifying high-risk groups of athletes and subsequently shaping intervention to the unique dispositions and risks of the targeted group (Kaluzka, 2000). The results of this study may therefore inform the development of more adequate care, support, and

intervention for athletes, especially avoidant copers. Accordingly, appropriate psychological and social support (regular check-ins, tele-consultation with a sports psychologist, maintenance of social connections with coach and training partners), as well as effective stress management interventions (stress reappraisal, stress mindset), could be provided during the COVID-19 crisis. Given that the sporting community is likely to be impacted for a significant time, future research should explore the extent to which different coping profiles can reduce or amplify the psychological impact of the COVID-19 crisis not just on emotional distress and short-term functioning, but also on the long-term development of athletes' well-being and health.

Acknowledgements

The authors would like to express sincere gratitude and thanks to the coaches, sports federations and institutes for their support and help, as well as to all the athletes who participated in this study.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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