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Athletes' motivation, anxiety, and locus of control at the Brazilian powerchair football national championship

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Abstract: The aim of this study was to evaluate motivation, competitive anxiety, locus of control and their associations with performance and training parameters. This cross-sectional study included 24 male athletes (M_{age} = 28.3 years, SD = 11.0) who were approached during the functional classification session, the day prior to the start of the Brazilian Powerchair Football National Championship and invited to participate in the study. The Sports Motivation Scale-II, Competitive State Anxiety Inventory-2, and Locus of Control in Sports Scale were used to collect data. From the results, autonomous motivation was more prominent than controlled motivation and amotivation. In addition, athletes were more self-confident than anxious and more frequently perceived internal and external locus of control than a "greater forces" locus. Internal locus of control was correlated with years of practice, hours of training, and sessions per week. Furthermore, cognitive and somatic anxiety were positively correlated with training sessions per week. Long-term follow-up of these athletes would allow better understanding how to promote and maintain a positive athletic psychological profile, ultimately affecting sports performance.

Keywords: disability; sport; psychological profile

Introduction

In the last few decades, Paralympic and adapted sports have expanded opportunities for practice, modalities (e.g., goalball, wheelchair rugby) and technologies. Consequently, the demands for professionals, methods of training and sports performance enhancements have increased (Dieffenbach & Statler, 2012). Only in the last 10–20 years have sports psychology theories and practices been used as resources to support athletes with disabilities to pursue their goals (Kenttä & Corban, 2014). In general, sport psychology can be defined as the application of psychological theories and methods to enhance sports performance (Galluci, 2014).

Today, the notion that peak sports performance is due to the sums of physical, technical, and psychological preparation skills are well accepted. The main psychological attributes among athletes are the four Cs; confidence, concentration, consistency, and control (Butler, 2020). For athletes with disabilities, confidence and concentration have been reported as the two most important skills to perform at a higher level (Dieffenbach et al., 2009).

Motivation can be defined as the amount and quality of energy and activation that makes a person to start and persist in their behaviour (Deci & Ryan, 2000). In line with self-determination theory, motivation lies on a continuum of motivation, from amotivation (not doing anything) to intrinsic motivation (doing something for pure pleasure). In this

continuum, autonomous and controlled motivation must be distinguished as different qualities of motivation.

Autonomous motivation aggregates three different forms of regulation of motivation; intrinsic regulation (doing something for its own interest and enjoyment; satisfaction is given by the sports practice per se); integrated regulation (people have a sense that the behaviour is an integral part of who they are and their identity); and identified regulation (people feel freedom and volition because the activity is personally important and worthwhile). Those are the most positive types of motivation, because the behaviour stimulated by them is integrated with the sense of self (Deci & Ryan, 2008). Intrinsic motivation is associated with performance (Di Domenico & Ryan, 2017), and is a strong predictor of performance, especially regarding performance quality (Cerasoli et al., 2014). Integrated and identified regulations are also positively associated with performance (Standage, 2012).

Nevertheless, in certain situations, more regulated motivations, such as training to overcome the opponent, can be effective in sports performance (Taylor, 2015). However, controlled motivation does not relate to personal interests or needs, hence is a poor predictor of vitality, sports satisfaction, and well-being (Deci & Ryan, 2012; Rigby & Ryan, 2018). Three other types of motivation regulation are present in controlled motivation; introjected regulation (doing something to avoid guilt or shame); extrinsic regulation (doing something to avoid punishment or to gain an advantage; and amotivation) having no intention of doing something (Deci & Ryan, 2012).

Autonomous motivation is nurtured when psychological needs for competence, relatedness, and autonomy are fulfilled (Di Domenico & Ryan, 2017). It may be related to consistency and confidence skills. Athletes with disabilities may have a unique perspective regarding their motivation to compete. On the one hand, research on athletic identity showed that although athletes with disabilities see themselves as seriously committed to sports, especially those at the elite level. On the one hand, research on athletic identity showed that although athletes with disabilities see themselves as seriously committed to sports they typically feel that the public does not see them as legitimate athletes , which may threaten satisfaction of the need for competence. This is especially true for those at the elite level (Van de Vilet, 2012). For many athletes with disabilities, sports participation requires the use of advanced assistive technology or an athlete without disabilities to compete (e.g., electric chairs, guide). This situation, if not well handled, threatens the need for autonomy (Kenttä & Corban, 2014).

On the other hand, individuals with major degree of physical impairment may experience autonomy and competence when doing activities that are compelled by intrinsic motivation (Kingston et al., 2006). Autonomy and competence were mentioned when powerchair football athletes described their playing experiences (Cottingham et al., 2015; Wolski, 2016). Moreover, athletes with disabilities appear to be more satisfied with their results than athletes without disabilities (Dieffenbach & Statler, 2012), which may be evidence of greater autonomous motivation. However, we must recognize that external factors – such as medals, public recognition, and financial rewards are relevant in the competitive sport scenario. Hence, extrinsic motivation is also important to understand within adapted sport participation (Perreault & Vallerand, 2007).

While the positive influence of autonomous motivation (i.e., intrinsic motivation, integrated, and identified regulations) are verified for sports performance (Standage, 2012), the influence of competitive anxiety is not so clear (Jones & Hanton, 2001). The multidimensional nature of anxiety may explain the negative and positive relations of anxiety with performance (Campbell & Jones, 1997).

Competitive anxiety may be defined as a negative psychological state related to performance of sports task demand (Ford et al., 2017). Of the four Cs previously mentioned, anxiety may be related to concentration, as a threat to it. According to multidimensional competitive anxiety theory (Martens et al., 1990a), cognitive and somatic anxiety are distinct components. The former refers to negative thoughts and expectations regarding performance, and the latter refers to the physiological manifestation of changes in autonomic arousal, such as elevated heart hate, sweating, palpitations, and shortness of breath (Morris et al., 1981). Still according to the multidimensional competitive anxiety theory, the response given to a sports competition may be an anxious one or another state characteristic, as self-confidence to reach the goal established (Vealey, 1990). Self-confidence plays a critical role on successful sports performance, and its lack is related to athletes' failure (Feltz, 2007). Self-confidence was positively related to athletic performance among wheelchair tennis and badminton athletes (Abdullah et al., 2021) and positively related with years of competitive experience of athletes from various paralympic sports (Ferreira et al., 2007).

Anxiety can be taken as a trait of personality, making the appraisal of situations as threatening in all circumstances, or a state. The psychological and physiological moment-to-moment reactions are strictly related to the environment and stressors (Kennedy et al., 2001; Vagg et al., 1980). Regarding sport performance, the multidimensional competitive anxiety theory states that cognitive state anxiety will be negatively associated with performance, whereas somatic state anxiety will decrease performance if low, facilitate performance up to its optimal level, and decrease performance beyond this point (Martens et al., 1990b). Finally, competitive anxiety can be measured by its intensity (low or high), its frequency (always to never), and its directional perceptions (positive or negative). These appraisals of anxiety have distinct patterns of influence on sports performance (Mellalieu et al., 2006.

Among athletes without disabilities, trait anxiety is negatively associated with performance (Halvari & Gjesme, 1995; Morgan et al., 1988), while optimal somatic state anxiety is associated with greater performance (Turner & Raglin, 1996). In meta-analysis studies, the effect of cognitive anxiety was both positive and negative on performance (Craft et al., 2003; Woodman & Hardy, 2003). Conversely, somatic anxiety had a very small effect on performance (Craft et al., 2003). For team sport athletes, a negative correlation was found between trait anxiety, integrated regulation and intrinsic motivation (Schuring et al., 2017; Sheehan et al., 2018).

However, evidence from athletes without disabilities must be interpreted with caution. Despite previous research indicating more similarities than differences between and athletes with and without disabilities (Dieffenbach & Statler, 2012), the environment and potential challenges of athletes with disabilities may affect competitive anxiety are unique. For instance, classification (the categorization routine with physical and function tests to determine in which class the athlete will compete) may be an anxiety-provoking situation specific to adapted sports, given the risk of misclassification, and hence, assignment to an inappropriate competitive level (Kenttä & Corban, 2014). Additionally, athletes with severe degree of impairment may experience negative stigma towards their body appearance and functional differences, which may cause discomfort and social physique anxiety (Martin, 2010). Given these factors, it is important to investigate anxiety to understand it in the unique context of adapted sports.

Both competitive anxiety and motivation are closely related to personal characteristics and the environment. There is an additional psychological trait that mediates the appraisal of anxiety and motivation regulation, the locus of control. According to Hanton et al. (2012),

the locus of control can be considered a psychological resource for athletes, generating protection from the negative impact of stressors appraised as uncontrollable and facilitating a resilient response to stressors. Once again, returning to the four Cs of the sports performance peak, the locus of control may be related to the perception of control itself.

An internal locus of control is also closely related to the basic psychological need for autonomy, which denotes its close relationship with motivation (Quested et al., 2013). The environment can also contribute to this mediation because controlling coaches, who frustrate athletes' need for autonomy through authoritarian, coercive behaviours, or with pressure through commands and deadlines, probably induce a change in the athletes' perceived locus of control, from internal to external (Tessier et al., 2013).

Athletes without disabilities with an internal locus of control believe they are responsible for their outcomes whether they are wins or losses (Ntoumanis & Jones, 1998). Those with an internal locus of control may be vulnerable to competitive anxiety because of the sense of personal responsibility over the outcome (Lefcourt, 2014). However, having a sense of higher control over stressful situations may have the opposite effect, and low state anxiety may be exhibited (Belinchón-de-Miguel et al., 2019). Moreover, athletes without disabilities with an external locus of control perceive their outcomes as unrelated to their effort or skill, instead resulting from chance or their coach's expertise. Amotivation is related to an external locus of control, supported by the understanding that this motivation style is mainly a result of lack of competence or positive efficacy expectations (Ryan & Moller, 2017).

Among athletes with disabilities, there is evidence to suggest that athletes more frequently perceive an external, than an internal, locus of control (Hutzler & Bar-Eli, 1993), as well as there is evidence that the athletes with disabilities perceive an internal locus of control more frequently, particularly associated with self-efficacy (Peña et al., 2016). Because the scarcity of research about this topic on adapted sports is notable, more research is needed to clarify the relationship between sports performance and locus of control.

The Present Study

In this present study, we investigate motivation, anxiety, and locus of control in powerchair football athletes. Powerchair football is the first and only competitive team sport for motorized wheelchair users (Federation Internationale de Powerchair Football Association, 2010). It is played on a court the size of a conventional basketball court and consists of two 20-minute periods separated by a 10-minute half-time break. The game is played by two opposing teams of four players each (including a goalkeeper) using power wheelchairs equipped with footguards and run at a maximum speed of 10 km/h. As in regular football, the aim is to score a higher number of goals, with the ball crossing the goal line (National Disability Sports Alliance, 2009; Federation Internationale de Powerchair Football Association, 2010; Senk, 2018; Wilson & Clayton, 2010; Wolski, 2016).

Despite the lack of public awareness, powerchair football is an increasingly popular exercise option for athletes with a high degree of physical impairment (Karmarkar et al., 2009; Kumar et al., 2012) from conditions such as cerebral palsy, muscular dystrophy, spinal muscular atrophy or other physical disabilities that necessitate the use of a power wheelchair in daily activities (Jeffress & Brown, 2017). There are two classifications of players: PF1, for those with a high level of physical limitations, and PF2, for players with "moderate to mild levels of physical difficulty which affects their overall performance" (Federation Internationale de Powerchair Football Association, 2010, p.6).

Unfortunately, some barriers prevent the practice of the sport. For example, there are few places to train, and it is tiring for the athletes and is a difficult sport to play (Barfield & Malone, 2013). There are numerous benefits of the sport that have been described, including enjoyment, social contact, friendship, empowerment, self-efficacy, sense of normalcy,

development of communication skills, and independence to the athletes (Cottingham et al., 2015; Jeffress & Brown, 2017). Powerchair football athletes acknowledge that teammates challenge them to improve and that their desire to improve is similar to that of athletes without disabilities. Importantly, athletes report that the objective of training is to improve, compete, and win. Powerchair football athletes wish to be recognized as competitive athletes and do not want people to pity them (Cottingham et al., 2015; Wolski, 2016).

Because it is a growing sport, it is important to have a better understanding of the psychological skills (Butler, 2020) in powerchair football to support selection of the most appropriate psychological training strategies for success. Additionally, considering the paucity of research on sport psychology in athletes with higher degree of physical impairment, and the fact that to date, there have been no studies that have explored this issue in powerchair football (Senk, 2018), the aim of the current study was to begin to address the knowledge gap, evaluating the psychological characteristics of powerchair football athletes at the Brazilian Powerchair Football National Championship. In this cross-sectional study, adopting an exploratory approach, we evaluated the motivation, competitive anxiety, and locus of control associated with the athletic level, athlete classification, time spent in practice, frequency of training, and hours of training per week. We understand that although elite athletes with disabilities share common characteristics with athletes without disabilities, the uniqueness of the population – with higher degree of physical impairment and dependence on technology to compete – should be considered. Hence, in this work, no hypotheses were made regarding the population and sports characteristics in light of the lack of previous evidence about powerchair athletes and the manifestations of the constructs examined.

Materials and Methods

Participants

The current paper is an exploratory cross-sectional study. All the athletes registered at the Brazilian Powerchair Football National Championship were eligible for this study. The only exclusion criterion adopted for this study was based on functional classification in other words, if the athlete be considered non-eligible to dispute the competition, that athlete should not be part of the sample of the study.

A total of 33 athletes were enrolled at this sports event, and a sample of 24 male powerchair football athletes (73% of the total) from five teams, team A (n = 1), team B (n = 7), team C (n = 4), team D (n = 6), and team E (n = 6), took part in the study. The athletes who declined participation claimed the study could be time consuming; all but one from team A followed their coach's recommendation not to participate in the study.

Procedures

All research procedures were approved by the Brazilian Power Soccer Federation and from the Human Ethics Research Committee of Army Center of Physical Conditioning (CAAE: 17691113.1.00005235). Athletes were approached during functional classification the day prior to the start of the Brazilian Powerchair Football National Championship and invited to participate in the study. The objectives and procedures of the research were verbally explained by the researchers, and those who were willing to participate signed an informed consent form. Athletes then individually completed the study questionnaires in a private room. To avoid bias, the first author helped all athletes mark their answers without any interference. Participants were assured of their anonymity and privacy. The volunteers did not receive any compensation for their participation.

Variables

There were three variables; motivation regulation, competitive anxiety, and locus of control. The predictors of those are the years of training, sections per week, hours of training per week and functional classification. Given the limited scenario of the research (one competition event) potential confounders are limited to athletes' specific disabilities. This confounding variable may be minimized by the fact that all athletes have a high degree of physical impairment, including muscular distrophy, splinal muscular atrophy and cerebral palsy.

Measurements

Sports Motivation Scale-II (SMS-II; Pelletier et al., 2013) was developed to evaluate the motivations for practicing sports under the self-determination theory framework (Deci & Ryan, 2008). The scale includes 18 items distributed among six factors: (1) intrinsic regulation: personal satisfaction as the main motivation - items 3, 9, and 17; (2) integrated regulation: training is coherent with other values, needs, and personal goals - items 4, 11, and 14; (3) identified regulation: training is personally important and deemed worthy - items 6, 12, and 18; (4) introjected regulation: avoidance of guilt, shame or pity - items 1, 7, and 16; (5) external regulation: motivated by the desire to win prizes - items 5, 8, and 15; and (6) amotivation: no specific intention to train - items 2, 10, and 13. Motivation was assessed using a 7-point Likert scale ranging from 1 = completely disagree; to 7 = completely agree. The sum of items within a factor was totalled, with higher scores indicating higher agreement with motivation type. The Brazilian version of the SMS-II (Nascimento Junior et al., 2014) has been shown to adhere to the original structure of the scale; RMSEA = 0.05;CFI = 0.92; NFI = 0.84; TLI = 0.90; and showed evidence of internal reliability ; .70 <α < .88; in a sample of 316 Brazilian athletes.

Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990) is designed to evaluate symptoms of competitive anxiety prior to competition, with a focus on worries and lack of self-confidence. The original structure of the CSAI-2 was confirmed in Brazil; RMSEA = 0.068 - 0.071; GFI = 0.80 - 0.82; CFI = 0.81 - 0.84; $\chi 2/df$ = 2.23 – 2.31; 0.69 < α <0.86. The factors were as follows: (1) cognitive anxiety: negative thoughts and self-talking - items 1, 4, 7, 10, 13, 16, 19, 22, and 25; (2) somatic anxiety: physiological manifestations of anxiety - items 2, 5, 8, 11, 14, 17, 20, 23, and 26; and (3) self-confidence: the strength to achieve success - items 3, 6, 9, 12, 15, 18, 21, 24, and 27 (Coelho et al., 2010). Items were scored on a 4-point Likert scale ranging from 1 = nothing; to 4 = a lot. All items for each factor were summed, and higher scores indicated a higher level of anxiety or self-confidence.

Locus of Control in Sport Scale (LCSS; Balbinotti & Barbosa, 2008) was developed in Brazil to assess what or who athletes credit for their success. The evidence of the validity of this test included, the total variance explained in the exploratory factor analysis was 39.71%; and internal consistency; α > 0.60 were explored by Barbosa (2011). The scale has nine items with 3 factors: (1) internal locus of control: success is a personal responsibility and depends on the athlete - items 1, 4, and 7; (2) external locus of control: success is attributed to the coach - items 2, 5, and 8; and (3) greater forces locus of control: success is attributed to chance or luck - items 3, 6, and 9. Responses were scored on a 5-point Likert scale, 1 = totally disagree, 5 = strongly agree. Higher scores indicated greater agreement with the particular locus of control.

Statistical Analysis

Measures of central tendency and variability (i.e., mean, median, standard deviation, and minimum and maximum values) were used for initial descriptions of the data. The Shapiro-Wilk normality test was used to verify normal distribution of the data. Because data were nonparametric, we used the Spearman correlation test to investigate the associations

between variables. We used the Friedman test to investigate differences between motivational regulations, anxiety traits, and locus of control styles, formed according to the sum of items of each factor. We used the Dunn test for post hoc analysis. The Kendall´s W effect size was used to interpret the magnitude of the difference among the groups, in order to interpret the importance of such differences (Tomczak & Tomczak, 2014).

The difference in psychological variables between athletes classified as PF1 and PF2, and within the group of athletes with national or international level of competitive experience were evaluated with Mann-Whitney test. The R effect size were used in this case, and its interpretation follows the one adopted for Kendall's W.

Spearman correlation coefficients were calculated to evaluate associations among the variables of the study. We used the Hinkle et al. (2003) procedure for interpreting the size of the correlation coefficient, in which 0.00 - 0.30 indicates a negligible association, 0.31 - 0.50 indicates a low association, 0.51 - 0.70 indicates a moderate association, 0.71 - 0.90 indicates a high association, and 0.91 - 1.00 indicates a very high association. Missing data were handled with listwise deletion. SPSS version 27 software was used for all analyses, and for all tests, $\alpha = 0.05$ was considered the threshold for statistical significance.

Results

A total of 24 male athletes took part of the study. The mean age of the participants was 28.3 (SD = 11.0) years, ranging from 18 to 57 years old, with a mean duration of powerchair football practice of 2.42, SD = 1.86 (min = 0.5; max =6) years. Muscular dystrophy was the most common reason for physical limitation (41.7%), followed by spinal muscular atrophy (16.7%), and cerebral palsy (12.5%), with the remaining players having congenital malformations, tetraplegia, arthrogryposis, deforming polyarthritis, fibromatosis, and unspecified polyneuropathy. Of all participants, 10 were classified as PF1 (high level of physical limitation) and 14 as PF2 (mild to moderate level of physical limitation). Regarding the athletic level, 41.7% of participants competed at the national level, 33.3% competed internationally, and 25% did not provide this information. The mean weekly frequency of training was 1.26, SD = 0.45 (min =1; max =2) sessions, lasting 2.37, SD = 0.87 (min = 2; max = 4) hours. The majority of participants described themselves as single (66.7%), while 20.8% were in a romantic relationship, 8.3% were married and 4.2% did not answer this question. Over half of the participants (54.2%) were not currently students or employed, 29.2% were full-time students, and 16.6% were employed.

In Table 1 there are the descriptive statistics and internal consistency evidence for this study for each variable. Generally, the highest motivation scores were found for intrinsic, integrated, introjected, and identified regulation. There were statistically significant differences from the Friedman test ($\chi2(5) = 78.34$, $p < 0.001$, with moderate effect size: $W = 0.78$), among motivation regulation styles. From the post hoc test, external regulation was statistically significantly different from intrinsic ($p < .001$), integrated ($p < .001$), identified ($p < .001$), and introjected regulation ($p = .007$) , and amotivation was statistically significantly different from intrinsic ($p < .001$), integrated ($p < .001$), identified ($p < .001$), and introjected regulation ($p = .002$).

Self-confidence scores were statistically significantly greater than anxiety symptoms ($\chi2 (2) = 32.67$, $p < 0.001$, with moderate effect size: $W = 0.68$). From the post hoc analyses there were statistically significant differences between both self-confidence and somatic ($p < .001$) as well as self-confidence and cognitive anxiety ($p = .001$). Statistically significant differences were found between locus of control ($\chi2 (3) = 29,21$, $p < 0.001$, with moderate effect size: $W = 0.61$). Specifically, while internal and external locus of control did not statistically differ ($p = 0.21$), they were both statistically different from great force locus of control, ($p = .006$ and $p < .001$; respectively).

From the Mann-Whitney test, there were no statistically significant differences in amotivation (p = .14), intrinsic (p = .27), integrated (p = .20), identified (p = .25), introjected (p = .38), and external motivation (p = .41); cognitive and (p = 0,13) somatic anxiety (p = 0,37); self-confidence (p = .91); internal (p = .98), external l (p = 0,71) and great forces locus of control (p = .14) between athletes classified as PF1 or PF2. Regarding the athletic level, statistically significant differences were neither found for amotivation (p = 0,90), intrinsic (p = .51), integrated (p = .19), identified (p = 0.25), introjected (p = .17), and external motivation (p = .48); cognitive and (p = .27) somatic anxiety (p = .36); self-confidence (p = .36); internal (p = .98), external (p = .96) and great forces locus of control (p = .57) between athletes who compete at national and international level.

Table 1. Description analysis and internal consistency.

	M	SD	Md	Min-Max	α
Intrinsic regulation	6.47	0.68	6.66	5 - 7	0.61
Integrated regulation	6.08	0.90	6.33	4.33 – 7	0.60
Identified regulation	6.09	0.86	6	4 – 7	0.60
Introjected regulation	5.39	1.34	5.66	3 - 7	0.58
External regulation	2.60	1.67	2.66	1 – 5.67	0.73
Amotivation	1.71	0.85	1.33	1 – 3	0.55
Cognitive anxiety	2.12	0.81	1.80	1 – 3.6	0.87
Somatic anxiety	1.75	0.65	1.43	1 – 3.14	0.75
Self-confidence	3.43	0.51	3.4	2.2 – 4	0.77
Internal locus of control	3.85	0.77	4	2.33 – 5	0.69
External locus of control	4.28	0.60	4	3.33 – 5	0.81
Greater forces locus of control	2.85	0.71	2.66	2 – 4.67	0.69

Note: M = mean; SD = standard deviation; Md= median; min= minimum value; Max = maximum value; α = Cronbach's alpha value. Values above 0.60 are preferable.

Associations between motivation, competitive anxiety, years of practice, and team training parameters were evaluated. Correlation data are displayed in Table 2. The internal locus of control had a low and positive correlation with years of practice, r_s= .45, p = .02, and sessions per week, r_s= 0.47, p = .02, and a moderate and positive correlation with total hours of training per week, r_s= 0.56, p = .005. Sessions per week were also moderate and positively correlated with somatic anxiety, r_s= 0.51, P = .01, and cognitive anxiety, r_s= 0.57, p = .004. Self-confidence was moderate and positively associated with years of practice, r_s= 0.51, p = .01.

Discussion

The aim of the current study was to evaluate psychological characteristics that can be linked to the four Cs of peak performance. Here confidence, concentration, consistency and control was operationalized and measured as self-confidence, anxiety (in the case, reflecting a threat to concentration), motivation, and locus of control, respectively at the Brazilian Powerchair Football National Championship. In addition, associations between those variables, athletes' experiences, and routine team training were analyzed.

Table 2. Correlations among sport psychological variables, years of practice, and training parameters.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Years of practice	-													
2 Sessions/week	0.06	-												
3 Hours/week	0.33	0.86**	-											
4 Intrinsic regulation	-0.19	0.24	0.20	-										
5 Integrated regulation	0.42	0.33	0.33	0.21	-									
6 Identified regulation	0.06	0.27	0.23	0.57**	0.77**	-								
7 Introjected regulation	0.22	0.18	0.18	0.46*	0.21	0.33	-							
8 External regulation	0.05	-0.05	0.09	-0.30	0.10	-0..03	-0.27	-						
9 Amotivation	-0.01	-0.29	-0.25	-0.57**	-0.42	-0.51*	-0.20	0.18	-					
10 Cognitive anxiety	-0.22	0.57**	0.31	-0.12	0.20	0.18	-0.06	0.17	0.01	-				
11 Somatic anxiety	-0.12	0.51*	0.36	-0.17	0.11	0.27	0.03	0.07	0.21	0.77**	-			
12 Self-confidence	0.51*	0.15	0.34	0.27	0.41	0.20	0.35	0.11	-0.20	-0.23	-0.14	-		
13 Internal locus of control	0.45*	0.47*	0.56**	0.34	0.55**	0.40	0.31	0.03	-0.52*	0.24	0.12	0.34	-	
14 External locus of control	-0.03	0.32	0.24	0.17	0.28	0.19	0.18	0.19	-0.42*	0.39	0.04	0.01	0.45*	-
15 Great forces locus of control	-0.01	-0.02	-0.18	-0.36	-0.20	-0.40*	0.09	0.14	0.30	0.21	0.09	-0.16	-0.25	0.25

Note: * statistical significance at $p < .05$; ** $p < .01$; *** $p < .001$

Participants in the study presented positive athletic profiles, with the autonomous motivational regulation (intrinsic, integrated, and identified) more prominent than controlled motivation (less autonomous, focused only on rewards or punishment avoidance), and amotivation, with strong effect sizes (W). This motivational profile, focused on tasks, pleasure, and mastery, was also observed by Pensgaard et al. (1999) in their study with Olympic and Paralympic athletes. Nevertheless, from Banack and colleagues' (2011) study of Paralympic athletes, perceived coach autonomy support was a predictor of athletes' perceptions of autonomy and relatedness as well as perceived competence was a significant predictor of intrinsic motivation. Because of the autonomous motivational regulation identified in data, and because autonomy and competence of athletes with disabilities may be threatened (Kenttä & Corban, 2014), we suggest, based on the results, the importance of investigating the relationship between coach behaviour and athlete motivation for athletes with disabilities. We also observed high introjection scores, which can be considered controlled and low-quality motivation (Roth, 2019). In previous studies, introjected regulation was associated with higher levels of stress, anxiety, antisocial behaviours, and negative emotions (Ryan & Deci, 2000, 2017). Additional research in among athletes with disabilities could indicate whether these results indicate that these athletes are driven by involvement of the ego, or focus on the approval of self and others, as expected in high-performance athletes without disabilities (Taylor, 2015).

In addition, looking for the remain psychological variables, a higher self-confidence and lower anxiety levels, with moderate size effect, was found. This may be the result of the level and motivational profile of these athletes (Kolayis, 2012), along with a more internal and external locus of control than attribution of success to luck or chance. Generally, this profile suggests that athletes will persist in training, has the strength to achieve success because of their self-confidence, and are able to cope with challenges and adversity (Ryan & Deci, 2000; Woodman & Hardy, 2001). No differences emerged for this profile between athletes from PF1 and PF2 level of classification; neither from national or international level of experience, meaning that despite the physical limitation and past experience, they had equivalent psychological skills at the competition.

The internal locus of control was correlated with years of training, training sessions per week, and hours of training per week. We may infer dependence between the experience of training and the attribution of results to their own effort and responsibility. Cognitive and somatic anxiety were positively associated with training sessions per week. It is likely that, as with any athlete, the more one trains, the higher the expectation of a result is nurtured (Ferreira et al., 2007; Martin, 2015). All these associations should be considered carefully, and no cause-effect inference may be made here. However, if it is confirmed that these variables are dependent, we can alert coaches and sports psychologists to closely examine anxiety levels and locus of control in the long term.

The limitations of the study must be pointed. There is a limited number of athletes recruited in this non-probabilistic sample and hence, no generalization should be made. The exploratory and cross-sectional nature of the study limits the verification of causal relationships among the variables. Also, some factors had low internal consistency, measured with Cronbach's alpha – particularly the amotivation and introjected regulation factors from the motivation measure. Cronbach's alpha is an indicator of inter-relatedness of the items with the factor (multidimensional scale) or test (unidimensional scale) (Tavakol & Dennick, 2011). Values above 0.60 are acceptable for exploratory studies (Nunnally & Bernstein, 1994). The test values are influenced by the number of items per factor, decreasing with lesser items. This characteristic might explain our findings. This could be also a result of a lack of the proper representation of the construct under investigation, since

a scale made for athletes without disabilities may not capture entirely the manifestation of motivation in this sample. Furthermore, reliability is a property of the scores of the test in a reference sample, not of the test itself (Tavakol & Dennick, 2011). Hence, the results regarding amotivation and introjected regulation must be taken with care, since they have a higher amount of random error. A future study could run a factor analysis of the scales used here using persons with higher degree of physical impairment as a reference sample, to advance the quality of data generated in the cross sectional and longitudinal studies.

Despite those limitations, this study advances the understanding of powerchair football players' psychological skills since, to the authors knowledge, no previous work has investigated these variables. Furthermore, prior studies about the psychological traits of Paralympic athletes did not assess athletes with higher degree of physical impairment, as we had in our sample (e.g., Banack et al., 2011; Bastos et al., 2020; Martins & Whalen, 2014; McDougall et al., 2019; Pensgaard et al., 1999). Paraphrasing Kluckhohn et al., (1953) powerchair football athletes are in some respects like all other athletes, like some other athletes, and like no other athletes. Similar to all athletes, they want mastery and winning, not being resilience heroes (Cottingham et al., 2015), and as no other athletes, with regards to psychological regulation, their unique disabilities require a close and specific evaluation. We hope to add to the literature regarding this population with this descriptive and exploratory work.

Conclusions

In summary, our sample of Brazilian powerchair football athletes showed a positive motivational profile, highlighted by high intrinsic, integrated, and identified regulation scores, high self-confidence, and internal and external locus of control. Some psychological traits were associated with training variables, such as years of training, frequency, and hours of training session per week, regardless of physical classification and level of experience in powerchair football.

Perspectives

This study contributes to the advancement of understanding psychological profile of athletes with higher physical impairment. More specifically, individual who play powerchair football. We found that autonomous motivation regulation styles were higher in this sample, with lower levels of anxiety than self-confidence and with internal and external locus of control higher that great forces. The results points to a good psychological regulation among these athletes. However, future studies must explore the psychological regulation - with other variable such: attention; arousal, cohesion, inner strength, and sports performance, as well long term sports adherence.

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