Association between Competitive Anxiety, Hardiness, and Coping Strategies: A Study of the National Handball Team

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Original Article

Association between competitive anxiety, hardiness, and coping strategies: a study of the national handball team

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Abstract
Competitive anxiety is an important factor in an athlete's performance. It varies significantly in its strength and depends on gender, ethnicity, role, and training experience. Due to the importance of the hardiness and coping strategies for overcoming difficulties, It was hypothesized that competitive anxiety can be associated with these mechanisms as well as anxiety traits. Relationships between competitive anxiety, hardiness, coping strategies, anxiety trait, and anxiety state are investigated. Nineteen female players of the national handball team aged between 22 and 35 participated in the study. Russian versions of Ways of Coping Questionnaire (WCQ), State-Trait Anxiety Inventory (STAI), Sports Competition Anxiety Test (SCAT), and Personal Values Survey III-R (PVSIII-R) were used. While their hardiness scores were higher than the ones reported for non-athletes, no association between hardiness and competitive anxiety was revealed. Distancing and Escape-Avoidance coping strategies were positively correlated with anxiety traits. The negative association between Self-Controlling and Seeking Social Support was considered to be inherent for a sample on the female national handball team. It was concluded, the strength of competitive anxiety is not associated with coping strategies and hardiness. A connection between the direction of competitive anxiety with coping mechanisms and hardy attitudes can be assumed for further researches.
Keywords: competitive anxiety, coping, athletes, handball, adults

Introduction

Anxious states are a reaction of the organism to the possible threat that can happen in the future. It is associated with cognitive and physiological changes that may affect the effectiveness of learning and performance (Tomé-Lourido, Arce, & Ponte, 2019). Four types of anxiety depending on the context of its occurrence are distinguished by the interactional model: daily routines, physical danger, ambiguity, and social evaluation (Endler, Parker, Bagby & Cox, 1991). In addition to this classification, anxiety is divided into state and trait anxiety (Endler, Kantor, & Parker, 1994). While the former is a transient emotion marked by changes in arousal and feeling of tension, the later is an individual's propensity to respond anxiously. A term of competitive anxiety was developed to investigate changes in psychological states in athletes that occur in the context of the contest, which is associated with both social evaluation and physical danger.

Competitive anxiety is used to define changes in arousal and emotional state that occur in situations of competition (Martens, 1977). Like other types of anxiety, competitive anxiety includes somatic and cognitive components (Beck, Epstein, Brown, & Steer, 1988). According to the Yerkes-Dodson law, an optimal level of arousal is needed for efficient learning and performance (Diamond et al., 2006). However, there is evidence about variation in the dynamics of competitive anxiety changes between more and less experienced athletes (Huddleston, & Gill, 1981). According to Hanton, Neil and Mellalieu (2008), it is important to consider the perception of competitive anxiety by the athlete in the estimation of its impact on performance. Due to variation of the impact of the anxiety between facilitative and debilitative, it was assumed that the perception of one's state can have a strong influence on the outcome of the competition (Ntoumanis & Biddle, 2000). In addition, the study of Ha, Kang, and Han (2019) revealed cultural differences in anxiety trait, state, and competitive anxiety among professional basketball players. In addition to cross-cultural differences, gender, experience, and role in the team were identified as factors that affect the level of competitive anxiety (Ivaskevych et al., 2019).

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Many characteristics of the handball player can affect the level of anxiety. In addition to cultural differences, Ha, Kang, and Han (2019) reported variations to depend on the roles of players in basketball teams. Similarly, there are gender differences in the prevalence of anxiety disorders (Asher, Asnaani, & Aderka, 2016), competitive anxiety (Ponseti Verdaguer, Sese, and Garcia-Mas, 2016; Kurimay, Pope-Rhodius, & Kondric, 2017), and physiological process during anxious states (Seo et al., 2017). Lesinger et al. (2018) discovered the influence of the training experience of competitive anxiety among junior handball players. However, age does not affect the level of competitive anxiety among adolescents (Lesinger et al., 2018). Therefore, age inequality is not a reason for differences in competitive anxiety scores. In addition to the described factors, coping strategies that are developed during childhood and affect the efficacy of stressful situations overcoming may have an influence on the level of competitive anxiety.

The choice of the coping strategies is a reflection of the behavioral response of a person during the exposure to significant and relevant stress (Eschenbeck et al., 2018). Therefore, coping strategies are defined as behavior and beliefs that are used by a person to overcome difficult situations that are exceeding the available resources (Eschenbeck et al., 2018). Additionally, according to Lazarus and Folkman (1984), coping strategies can be distinguished on the problem- and emotion-focused, reflecting the extent to which a person can affect the problem. If the person has a lack of resources or ability to change the situation than the emotional copings are developed. In other cases, when the person can actively contribute to the resolution of the stressful impact, problem-focused coping is applied. In this regard, coping appears to be a response to emotion and is aimed to reduce arousal or tension (Folkman & Lazarus, 1990). Furthermore, the state anxiety is proven to be predicted by the emotion-oriented stress response (Endler, Kantor & Parker, 1994). In addition, the choice of coping is significantly related to age, gender, and type of sport (Dziembowska et al, 2019; Case et al, 2016; Imas et al, 2018).

According to Folkman and Lazarus (1990), the nature of coping is similar among animals and humans, reflecting the activity of the mechanisms of adaptation. However, if the coping strategy of an animal is directed on survival, the effectiveness of the human coping can be assessed in terms of quality and process, drawing attention to the adherence to reality and flexibility. Additionally, there is evidence about the shift toward more active copings between 9 and 11 years old (Eschenbeck et al., 2018). The findings of Maeng et al. (2017) indicate that age-related changes in coping strategies are accompanied by the increase of reactive coping rate and decrease of stress reactivity. However, there are moderate cultural differences in coping strategies between collectivistic and individualistic societies (See & Essau, 2010). In contrast, culture, type of sport, and gender had a more severe impact on the use of problem-focused, emotion-focused, and avoidance coping strategies among the athletes (Döllen, Grove & Pepping, 2015). Though coping strategies are affected by many variables, there is evidence about the association between them and anxiety measures.

The findings of Gurieva, Zashchirinskaia, and Udavikhina (2019) indicate that adaptive coping strategies are associated with lower anxiety scores in the sample of managers. Similarly, there is evidence about the influence of coping strategies on the level of competitive anxiety and an athlete's perception of its influence (Ntoumanis & Biddle, 2000). Distancing was associated with lower scores of competitive anxiety, while venting and behavioral disengagement were higher among sportsmen with high levels of competitive anxiety (Ntoumanis & Biddle, 2000). According to this evidence, it could be hypothesized that competitive anxiety will be associated with the employment of different copings. In addition to coping strategies, a construct of hardiness can be employed to study the attitude of sportsmen to the competitions and adverse events.

Hardiness was introduced by Kobasa & Maddi (1977) to describe and measure attitudes that mediate the impact of the stress on performance and health. This construct includes commitment as an ability to pursue the aim despite the circumstances, control as a feeling of capacity to influence the situation and self, and challenge as acceptance of the changes and risks (Kobasa & Maddi, 1977). Though this concept was developed to describe the behavior of employees in the organizational setting, several studies revealed the association between hardiness and competitive anxiety. Golby and Sheard (2003) discovered that a higher league of professional rugby players is associated with higher hardiness scores. Hanton, Neil, and Mellalieu (2008) identified relationships between hardiness and recognition of competitive anxiety as a facilitative feeling. Due to these findings, a researcher can expect to identify links between the level of competitive anxiety, coping strategies, and hardiness scores.

Materials and Methods
Participants

Members of the national handball team were asked to participate in the study after the signing of informed consent. Participants of the study are 19 adults aged between 22 and 35 years old. The team participated in a study during the complex health examination, which took place in March 2019.

Instruments

Ways of Coping Questionnaire. Russian version of Ways of Coping Questionnaire (WCQ) (Folkman & Lazarus, 1988), which was developed by Bityutskaya (2015), was used to collect data about coping strategies.

The questionnaire includes 66 items, which indicate coping methods. With a Likert-type scale from 0 (never) to 3(most often use), participants indicated the frequency of a coping strategy's use. Items are divided between nine scales, which correspond to Confrontive Coping, Distancing, Self-Controlling, Seeking Social Support, Accepting Responsibility, Escape-Avoidance, Planful Problem-Solving, Positive Reappraisal, Wishful Thinking (Bityutskaya, 2015). Wishful Thinking scale was not considered into the analysis as it was excluded from the English version of WCQ (Folkman et al., 1986). Cronbach's alpha for the Russian version of WCQ is .870 (Bityutskaya, 2015)

Sport Competition Anxiety Test. Russian version of Sports Competition Anxiety Test (SCAT) (Martens, 1977), which was adopted by Hanin (1982), was used for evaluation of the competitive anxiety trait. The scale includes 15 items with three answers corresponding to the frequency of the described state experiencing. The final score varies between 10 (very low) and 30 (very high) points. Due to this, scale predicts situational competitive anxiety. Hanin (1982) reports higher scores in females compared to male athletes. Cronbach's alpha for the Russian version of SCAT is varied from .75 in a female sample to .83 in a male sample (Hanin, 1982).

Hardiness Survey. Leontiev and Rasskazova's (2006) version of Personal Values Survey III-R (PVSIII-R) was used in the study. Like the original version of the questionnaire, which was developed by Maddi and Khoshaba (2001), the adaptation consists of 3 factors: Commitment, Control, and Challenge. The whole survey consists of 45 Likert-type questions with answers "No", "Rather no than yes", "Rather yes than no", and "Yes". The score of the opposite answer varies between direct and reverse questions that were used to prevent the bias among respondents. The Commitment scale consists of 17 items (Cronbach's alpha = 0.84), the Control scale includes 17 elements (Cronbach's alpha = 0.87), and the Challenge scale is based on 10 questions (Cronbach's alpha = 0.69). The general score of Hardiness is equal to the sum of other scales and has a high internal consistency with Cronbach's alpha equal to 0.92. Leontiev and Rasskazova (2006) described common scores in their sample: 80.74 with SD = 18.53 for Hardiness, 37.64 with SD = 8.08 for Commitment, 29.1 with SD = 8.43 for Control, and 13.91 with SD = 4.39 for Challenge.

State-Trait Anxiety Inventory (STAI). A Russian-language version of Spielberger's STAI was used to estimate anxiety trait and anxiety state (Spielberger, 2010). The questionnaire was translated and developed by). The inventory consists of two scales with 20 4-point Likert-type items. Cronbach's alpha for Anxiety State scale varies between 0.87 and 0.98, while the internal consistency of the Anxiety Trait scale is within 0.66 – 0.78 interval (Hanin, 1976). According to Hanin's (1976) estimations, scores below 30 can be considered as low levels of state and trait anxiety. A high level of anxiety can be stated if the result is equal to or exceeds 45.

Procedure

The Handball Federation of Ukraine ordered the study in the Scientific Research Institute of the National University of Physical Education and Sports of Ukraine. Informed consent was obtained from the parents of each participant before the administration of questionnaires. WCQ and SCAT were administered with a software-hardware complex of psychological and psychophysiological diagnostics "BOS-TEST-Professional". Responses to each particular question from these questionnaires remain unknown to researchers. Due to the inaccessibility of these data, Cronbach's alpha for each test was obtained from the literature. The Hardiness Survey was administered with Google Forms. Reposts on the basis of results were provided to the coach and front office of the Handball Federation of Ukraine. All statistical procedures were conducted with R in RStudio environment. Mendeley software was employed to systematize literature and provide a theoretical background of the paper.

Results

Descriptive Statistics

Investigation of histograms and the Shapiro-Wilk test revealed a significant difference in the sample distribution from the normal distribution. Due to this issue, non-parametric statistics were used to describe the results of the study. Median scores were in the sample were 38 for Commitment, 34 for Control, 20 for Challenge, 91 for Hardiness, 44.4 for Confronting Coping, 50 for Distancing, 66.7 for Self-Controlling, 61.1 for Seeking Social Support, 83.3 for Accepting Responsibility, 45.8 for Escape-Avoidance, 72.2 Planful Problem-Solving, 66.7 for Positive Reappraisal, 22 for SCAT, 36 for Anxiety State, and 55 for Anxiety Trait (Table 1).

Table 1. Descriptive statistics

Scale	M	25th percentile	75th percentile
Commitment	38	36	42
Control	34	29.5	35.5
Challenge	20	17.5	23.5
Hardiness	91	83.5	97.5
Confronting Coping	44.4	38.9	50

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Distancing	50	33.3	55.6
Self-Controlling	66.7	57.1	73.8
Seeking Social Support	61.1	52.75	75
Accepting Responsibility	83.3	58.3	91.7
Escape-Avoidance	45.8	39.6	54.2
Planful Problem-Solving	72.2	63.9	80.55
Positive Reappraisal	66.7	61.9	71.4
SCAT	22	17	25
Anxiety State	36	33	39.5
Anxiety Trait	55	53	60

A comparison of hardiness scores with common scores reported by Leontiev and Rasskazova (2006) reveals that athletes of handball national team have scores above average. For Commitment, Control, and Challenge 25th percentile is nearly equal to the average scores of students population. A similar comparison for Anxiety Trait and Anxiety State scores reveals a moderate level of state anxiety during participation in the research and most high level of trait anxiety (Hanin, 1976). Since 75% of participants have SCAT scores below 25, a moderate level of competitive anxiety was revealed (Hanin, 1982). Relatively high values above 33 for the 25th percentile for coping mechanisms' scales indicate the variability of adaptive strategies in subjects (Bityutskaya, 2015). Since Accepting Responsibility and Planful Problem Solving have the highest medians, these two strategies can be considered as the most popular ones.
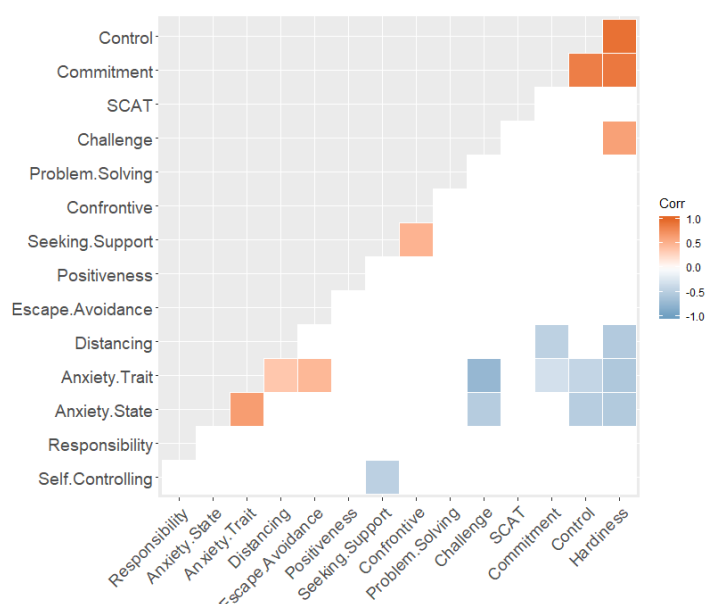

Figure 1. Correlational matrix

Note: only correlations with significance level p < 0.05 were depicted.
Correlations between Coping Strategies, Hardiness, and Competitive Anxiety
Due to the lack of normality in data, Spearman correlation coefficient was used to identify associations between coping strategies, hardiness, state, trait, and competitive anxiety. In addition to significant positive correlations between components of hardiness that varied between *0.62* and *0.89* (Table 2), Anxiety Trait and Anxiety State were moderately associated with *r = 0.59*. Anxiety State and Anxiety Trait had a moderate strength of negative connections with Hardiness and its components between *-0.52* to *-0.65*. Only Distancing from WCQ had a significant relation with Hardiness (*r = -0.50*) and Commitment (*r = -0.46*). In turn, Distancing had a positive correlation with Anxiety Trait. Similarly, Escape-Avoidance coping strategy had a positive interrelation with Anxiety Trait (*r = 0.61*). Seeking for Social Support was positively related to Confrontive Coping (*r = 0.54*) and negatively connected with Self-Control (*r = -0.50*). No relationships of SCAT with other variables were identified.

Discussion

It was revealed that members of the handball national team have higher scores than the ones reported by Bityutskaya (2015) for Russin adaptation of WQC, Leontiev and Rasskazova (2006) for Hardiness Survey, and Hanin (1976) for Anxiety Trait scale. Though evidence about the general population is mainly outdated, it can be assumed that athletes have higher levels of Anxiety Trait and Hardiness and its components. These findings are similar to the ones of Golby and Sheard (2003), who revealed higher Hardiness scores in rugby players from higher leagues. A further comparison with non-athletes is needed to confirm this statement.

A moderate correlation of hardiness with anxiety state and anxiety trait was revealed. These findings are in line with the works of Kobasa and Maddi (1977). Similarly, the association between Anxiety Trait and Anxiety State was reported earlier (Hanin, 1976). In contrast, Distancing as a coping strategy had a positive correlation with Anxiety Trait. This together with the absence of relationships between SCAT scores and other variables contradicts the results of Ntoumanis and Biddle (2000), who reported a negative association between competitive anxiety and distancing. Similarly, correlations of Seeking Social Support scale with Confrontive Coping and Self-Controlling can be partly explained by previous research. According to Bityutskaya (2015), Confronting Coping has a moderate positive correlation with Seeking Social Support. A correlation between these scales within the current study was also positive but stronger. In turn, no significant correlations were found between Seeking Social Support and Self-Controlling during adaptation of the WCQ for Russian-speaking society (Bityutskaya, 2015). Due to this, negative relationships between Self-Controlling and Seeking Social Support are the characteristic of the studied sample of athletes. For some reason, these two coping strategies develop simultaneously among Ukrainian female members of handball national team. A further investigation is needed to define the scope and reasons for this association. In addition to all these findings, the absence of correlations with SCAT scores should be discussed.

Table 2. Spearman Coefficients of Correlation

Pair of Variables	r
Anxiety State – Anxiety Trait	0.59
Anxiety Trait – Distancing	0.46
Anxiety Trait – Escape-Avoidance	0.61
Self-Controlling – Seeking Support	-0.50
Seeking Support – Confrontive Coping	0.54
Anxiety State – Challenge	-0.52
Anxiety State – Control	-0.53
Anxiety State – Hardiness	-0.61
Anxiety Trait – Challenge	-0.62
Anxiety Trait – Commitment	-0.46
Anxiety Trait – Control	-0.59
Anxiety Trait – Hardiness	-0.65
Distancing – Commitment	-0.46
Distancing – Hardiness	-0.50
Challenge – Hardiness	0.62
Commitment – Control	0.74
Commitment – Hardiness	0.86
Control – Hardiness	0.89

Note: only correlations with significance level $p < 0.05$ were presented.

While many connections between competitive anxiety, anxiety trait, hardiness, and coping strategies were hypothesized, SCAT scores revealed no significant correlation with the results of other questionnaires. Competitive anxiety strength is not influenced by hardiness and attitudes to stressful situations and is not associated with Anxiety Trait scores. According to the data of Maynard and Howe (1987), correlations between SCAT scores and Anxiety Trait can be expected. Evidence of Hanton, Neil, and Mellalieu (2008) allows expecting an association between competitive anxiety perception and hardiness. Research by Ntoumanis and Biddle (2000) revealed a connection between competitive anxiety and coping strategies. While SCAT in the adaptation of Hanin (1982) cannot be used to estimate an athlete's attitude to the increase of arousal before the competition, all other relationships were not found within this investigation. According to Ntoumanis and Biddle (2000) and Hanton, Neil, and Mellalieu, (2008), hardiness and coping mechanisms can be associated with the directedness of competitive anxiety. An assumption about the connection between hardy attitudes and cultural differences in coping strategies employment can be tested in future studies.

Conclusions

Therefore, competitive anxiety was not associated with the anxiety trait, anxiety state, hardiness, and ways of coping within the sample of the female national handball team despite the existence of evidence from

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other researchers in support of these assumptions. A competitive anxiety score was not associated with any coping strategy. In turn, Seeking Social Support and Self-Controlling were positively associated with athletes. Variability of coping strategies, high scores of hardiness and anxiety traits were revealed among participants. Connections between hardiness and anxiety that were stated earlier were also replicated. Due to the replication of common associations, it can be stated that the absence of correlations between competitive anxiety scores and other variables can be a property of the Ukrainian female national handball team.

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Contributions

All authors contributed equally to this work, read and approved the final manuscript. Author contributions: D.I., S.T., S.V., I.K., and Y.P. conceptualized the overall project; D.I., S.T., Y.P. and S.F. designed research; D.I., S.F., Y.P. and O.I. conducted studies, collected the data, performed data analysis; D.I., S.F., Y.P., O.B., O.I., I.K., V.M., and S.T. wrote and edited the manuscript.

Conflicts of interest

The authors declare that they have no competing interests.

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