

Competitive anxiety in elite female floorball players

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Abstract

The purpose of this study was to examine competitive anxiety in elite female floorball players and if there are differences in anxiety ratings between players competing in the highest league in Sweden. Furthermore, the aim was to examine if playing time is associated with the competitive anxiety subscales. Participants were 81 elite female floorball players (mean age: 23.4 ± 3.1); 34 were classified as high experienced (mean age: 25.2 ± 2.5) and 47 as less experienced (mean age: 22 ± 2.9). Participants completed the modified Swedish revised scale of the competitive state anxiety inventory-2 (CSAI-2R) prior to a game. Multivariate analyses of variance were used to calculate differences between groups. Prediction of playing time based on the competitive anxiety subscales was tested with multiple regression analysis. The results showed that less experienced female elite floorball players perceived higher levels of cognitive anxiety $p < .001$. High experienced elite female floorball players had significantly higher self-confidence $p < .01$. No significant differences between groups were found in directional ratings. Modified CSAI-2R subscales predicted only 5-7% of the playing time, where cognitive anxiety direction was found to be significant $p < .05$. In summary, these findings suggest that competitive experience is of importance. No significant differences in interpretation of symptoms in terms of consequences for performance were stated, possibly due to the high levels of self-confidence. Future research of prevention and intervention programs related to competitive anxiety, in elite floorball players, especially in females and those with lower competitive experience is of importance.

Key words: athlete; performance anxiety; questionnaire; sports psychology

Abstrakt

Syftet med studien var att undersöka tävlingsrelaterad ångest hos kvinnliga elitinnebandyspelare och om det är några skillnader i skattad tävlingsrelaterad ångest mellan idrottare som spelar i högsta ligan i Sverige. Dessutom, var syftet att observera om speltid är relaterad till de olika delskalor gällande tävlingsrelaterad ångest. Deltog gjorde 81 kvinnliga elitinnebandyspelare (medelålder: 23.4 ± 3.1); 34 klassificerades som erfarna (medelålder: 25.2 ± 2.5) och 47 som mindre erfarna (medelålder: 22 ± 2.9). Deltagarna fyllde i formuläret av den modifierade svenska versionen av competitive state anxiety inventory-2 (CSAI-2R) innan en match. Multivariat variansanalys användes för att beräkna skillnader mellan grupperna. Förutsägelse av speltid baserat på de olika delskalorna testades med multivariat regressionsanalys. Resultaten visade att mindre erfarna kvinnliga elitinnebandyspelare upplevde mer kognitiv tävlingsrelaterad ångest $p < .001$. Erfarna kvinnliga elitinnebandyspelare hade betydligt högre självförtroende $p < .01$. Inga signifikanta skillnader kunde ses i skattad riktning mellan grupperna. Modifierade CSAI-2R delskalorna predicerade endast 5-7 % av speltiden, där kognitiv tävlingsrelaterad ångest var signifikant $p < .05$. Sammanfattningsvis, föreslår resultaten att tävlingserfarenhet har betydelse. Inga skillnader i tolkning av symptom vad gäller konsekvenser för prestation visades, möjligen på grund av höga nivåer av självförtroende. Framtida forskning av förebyggande - och interventionsprogram relaterat till tävlingsrelaterad ångest, hos elitinnebandyspelare, speciellt hos kvinnor och de innebandyspelarna med lägre tävlingserfarenhet är nödvändigt.

Sökord: frågeformulär; idrottspsykologi; idrottsutövare; prestationsångest

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1. Background

1.1 Introduction

Floorball is played in three 20-minute periods on a 40×20-meter court surrounded by a 0.5-meter high rink with one goal on each side. Each team has five field players and a goalkeeper participating in active play at the same time. The field players run to take the ball and score goals against the opposite team with their sticks (Andersson, 2018).

Floorball is a relatively new indoor sport that is rapidly gaining popularity. During its 40 years of official existence, floorball has developed from a spontaneous recreational activity into one of the fastest growing organized sports, and the International Floorball Federation currently has 70 member associations (IFF Main site, 2018b). According the Swedish Sport Federation, floorball is the fifth largest sport and the second largest team sport in Sweden (Riksidrottsförbundet, 2017). Sweden has the highest number of registered players in the world, followed by Finland and Czech Republic (IFF Main site, 2018a). There were 116 736 licensed players in Sweden 2018 (Svensk innebandy, 2019).

Even though floorball is a growing sport and commonly practiced in Sweden, research in the sport is limited. There are only a few international sport psychology studies done regarding floorball (Høigaard & Ingvaldsen, 2006; Kettunen & Välimäki, 2014; Tranaeus et al., 2015; van der Does et al., 2015).

In a systematic review from 2014, one study was found in the field of sports psychology (Tervo & Nordström, 2014). The “social loafing” effect in floorball players was investigated during a two-day floorball tournament. Participating in the study did 24 male students, with at least seven years of floorball experience on a recreational level (Høigaard & Ingvaldsen, 2006). The social loafing effect is described as a reduction in motivation and effort when individuals work collectively, compared to when they work individually (Latané et al., 1979). Furthermore, it was investigated if floorball players effort and performance were influenced by individual motivational factors. The study showed that identification of the individual contribution in interactive teams has a positive effect on performance and self-evaluation level of effort. Furthermore, identifiability reduced perceived social loafing (Høigaard & Ingvaldsen, 2006).

In a Dutch study, ten female floorball players were observed over six months. The effects of a player's physical – and psychosocial stress, and recovery on field-test performance was tested (van der Does et al., 2015). The study showed that with higher levels of psychosocial stress

reported, submaximal interval-based running performance was decreased. However, more physical stress in terms of training load improves agility up to six weeks before performance testing. The authors suggested that the results indicate importance of monitoring stress and recovery during an entire season, to be able to guide training programs and achieve successful performance (van der Does et al., 2015).

Another study showed that psychological skills training at group level was not affective in injury prevention in elite floorball players (Tranaeus et al., 2015). The teams in the intervention group participated in a psychological skills training programme with help of sport psychology consultants, involving six meetings with each team. The control group received no substitute. The authors argued that a group intervention forward a whole team, may not give the same impact as individual meetings with a sport psychology consultant. In a Master thesis project, a similar study design was performed. A psychological coaching programme consisting of six meetings was implemented as a group intervention for 24 Finnish elite female floorball players, whereas the control group received no supplement. The results showed that in those floorball players who reported high levels of stress, the intervention showed a positive effect on self-confidence and decreased stress levels (Kettunen & Välimäki, 2014).

Elite and sub-elite athletes must be able to perform under pressure and meet the demands of competition. How the athlete perceives these situations, can differ from one athlete to another. For example, these reactions can be experienced as a natural part of competition or it can be perceived as stressful for the athlete (Craft et al., 2003). However, there are gender differences in athletes' perceptions of anxiety. It has been shown that female athletes, sports in general, have higher levels of competitive anxiety compared to male athletes. Furthermore, younger athletes experience higher levels of competitive anxiety (Rocha et al., 2018).

Previous research has shown that anxiety differs between athletes performing team sports and individual sports. Athletes performing individual sports are more adversely affected by anxiety (Rocha et al., 2018; Terry et al., 1996). Another aspect of performance related to anxiety, is whether the sport is of open or closed nature. Open skill sports are defined as a sport in which athletes are required to react in an interactive, changing, and externally paced environment. In contrast with closed skill sports, where the environment is relatively highly consistent and self-paced for the athletes (Wang et al., 2013). Example of a closed skill sport is running, whereas examples of open skill sports are soccer and floorball. Research have

showed that the levels of anxiety in open skill sports are higher than in closed skill sports (Craft et al., 2003; Kleine, 1990).

It has been reported that higher skill level athletes are not as adversely affected by anxiety as lower skill level athletes (Kleine, 1990). In a meta-analysis (Rocha et al., 2018), higher levels of competitive anxiety were observed in athletes with less competitive experience from a qualitative perspective. From a quantitative perspective, although the difference was small, less experienced athletes had higher levels of competitive anxiety compared to the more experienced athletes. However, research suggests that the moderating effect of skill level on the anxiety/performance relationship should be studied further (Kleine, 1990). No significant difference in levels of competitive anxiety has been shown between starting and reserve athletes in competitive sport. The absence of differences has been suggested to be associated with the fact that these athletes are regularly submitted to the same routine, level of demand and sports result, which would have a similar impact on their experience of competitive anxiety (Rocha et al., 2018).

Competitive State Anxiety Inventory-2 (CSAI-2) is a questionnaire often used in sports psychology. CSAI-2 has 27 items and three subscales: cognitive anxiety, somatic anxiety and self-confidence (Craft et al., 2003). Cognitive anxiety refers to mental components of anxiety, negative self-evaluations and self-doubts about the athlete's ability to perform. Somatic anxiety is characterized by the physiological elements of anxiety, generated from an increase of autonomic arousal such as muscle tension and increased heart rate (Martens et al., 1990b). According to the multidimensional theory of anxiety, cognitive and somatic anxiety exhibits a negative relationship to performance and self-confidence a positive relationship to performance (Martens et al., 1990a).

Even though the CSAI-2 is often used in testing athletes for competitive anxiety, the validity of the instrument has been questioned (Craft et al., 2003; Lane et al., 1999). In addition to this, studies have evaluated a revised scale of the Competitive State Anxiety Inventory-2 (CSAI-2R) with a 17-item model with the same subscales. It has been recommended to use the CSAI-2R instead of the CSAI-2 for measuring competitive state anxiety in athletes (Cox et al., 2003) (Tsorbatzoudis et al., 2002). The Swedish version of CSAI-2 was evaluated using confirmatory factor analyses and the result as well suggested that it is better to use the CSAI-2R rather than the original CSAI-2, because of the data received from the CSAI-2 in its original form cannot reliably be trusted (Lundqvist & Hassmén, 2005).

Whether competitive anxiety is negative for performance in athletics, has been discussed in the literature. Research has showed that competitive anxiety can be perceived as both facilitating and debilitating to performance (Jones & Hanton, 2001; Mellalieu et al., 2003). A direction scale, in addition to the original CSAI-2, has been developed to provide further understanding of the competitive state anxiety response (Jones & Swain, 1992). The directional perception approach has been suggested to be more sensitive to differences between various levels of athletes, in contrast with ratings only based on anxiety intensity (Jones & Hanton, 2001). A study evaluated directional responses in elite and sub-elite young athletes using the modified CSAI-2R (Lundqvist et al., 2011). The results showed no significant differences between the groups in rated direction scores of cognitive or somatic anxiety at moderate to high intensity level. In low anxiety level, a significant difference in facilitative anxiety was found, suggesting that facilitative direction scores are a consequence of low anxiety intensity, probably combined with high levels of self-confidence.

In summary, floorball is commonly practiced in Sweden and previous research in the sport is limited, especially in the field of sports psychology (Tervo & Nordström, 2014), where further research in this field is important. Previous research suggest that the moderating effect of skill level on the anxiety/performance relationship should be studied further, and it has been reported that less experienced athletes have higher levels of competitive anxiety compared to more experienced athletes (Kleine, 1990; Rocha et al., 2018). Furthermore, it has been found that female athletes have higher levels of competitive anxiety compared to male athletes (Rocha et al., 2018).

1.2 Aim

The purpose of this study was to examine competitive anxiety in elite female floorball players and if there are differences in anxiety ratings between high – and less experienced players competing in the highest league in Sweden, using the modified Swedish CSAI-2R.

Furthermore, the aim was to examine if playing time during the previous game was associated with the competitive anxiety subscales of the questionnaire.

Based on theory and research associated with competitive anxiety, and the absence of research in the field of floorball the research questions for this study are:

1.3 Research questions

1. How elite female floorball players experience competitive anxiety, prior to a floorball game?
2. Is there a difference in competitive anxiety, between experienced elite female floorball players compared with less experienced elite female floorball players, prior to a floorball game?
3. Is it possible to predict playing time during the previous floorball game, based on the different competitive anxiety subscales?

1.4 Hypothesis

H₀ There is no difference between experienced and less experienced elite female floorball players in competitive anxiety measured with the modified Swedish CSAI-2R.

H_A There is a difference between experienced and less experienced elite female floorball players in competitive anxiety measured with the modified Swedish CSAI-2R.

H₀ It is not possible to predict playing time during the previous floorball game, using the different subscales on the modified Swedish CSAI-2R.

H_A It is possible to predict playing time during the previous floorball game, using the different subscales on the modified Swedish CSAI-2R.

2. Method

This study had a quantitative approach, with a cross-sectional design (Polit & Beck, 2010).

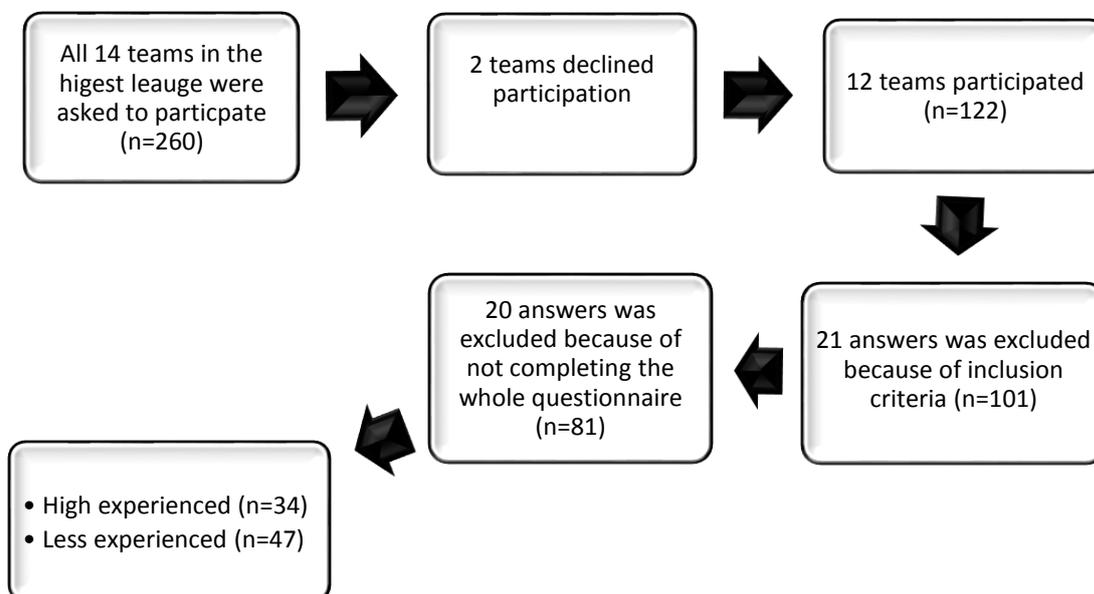
2.1 Participants

Elite female floorball players over age 18 playing in the highest league in Sweden, were asked to participate in the study using purposive sampling. All 14 teams in the highest league in Sweden were contacted to participate in the study. Two teams, with a total of 41 players, choose to decline participation. There were 260 registered players in the league, where 122 of the players answered the survey. Inclusion criteria was to play the upcoming game. There were 21 players who reported not to play in the next game and were thus, excluded from the study. Additionally, 20 players were excluded from the study since they did not complete the whole questionnaire, leading to a total response rate of 31 %. The participant flow is shown in Figure 1.

The sample consisted of 81 athletes with an average age of (23.4 ± 3.1) and years of floorball experience were (14.8 ± 3.1). The group was represented by all game positions; forwards

(51.9 %, n=42), defenders (37.0 %, n=30) and goalkeepers (11.1 %, n=9). The participants were divided into two groups, high - and less experienced elite athletes, based on how many years they had played in the highest league and if they had represented the national team in floorball at senior level. If they had represented the national team and/or if they had played at the highest level for five years, they were classified as experienced elite athletes. Leading to 47 athletes were classified as less experienced and 34 athletes as high experienced. The less experienced elite athletes had an age of (22 ± 2.9) and (14.3 ± 2.5) years of floorball experience. The high experienced elite athletes had an age of (25.2 ± 2.5) and (15.6 ± 3.3) years of floorball experience.

Figure 1. Flow chart of participation in the study



2.2 Instruments

In the study the modified Swedish revised scale of the competitive State Anxiety Inventory-2 was used to measure competitive anxiety in elite female floorball players (Jones & Swain, 1992; Lundqvist & Hassmén, 2005). The Swedish version possesses psychometric properties consistent with the English version, in terms of both acceptable internal consistency and model fit for all subscales (Lundqvist & Hassmén, 2005). The questionnaire consists of a 17-item model with three different subscales: cognitive anxiety, somatic anxiety and self-confidence. The athletes rated each item on an intensity and directional scale. The athletes responded on a four-point Likert scale that ranges from 1 “not at all”, 2 “somewhat”, 3 “moderate” and to 4 “very much so” regarding the intensity scale of each statement. For the direction scale the participants rated on a seven-point bipolar directional scale for each

statement, that ranges from -3 (very debilitating for performance) to +3 (very facilitative for performance), with a mid-point of 0 (Neither debilitating nor facilitative for performance). Furthermore, perceived importance of competition and uncertainty about the outcome of competition have been identified as primary factors in elevating the pre-competition anxiety (Martens et al., 1990a). The athletes rated the importance of the upcoming game on a seven-point scale from 1 “not important at all” to 7 “very important”. The uncertainty about the outcome was assessed by rating how confident the athletes were to win the upcoming game on a seven-point scale from 1 “not confident at all” to 7 “very confident”.

2.3 Procedure

Contact with the teams, to participate in the study was sent to all the female floorball teams in the highest league in Sweden through e-mail. After accepting participation in the study, a link with information about the study, requested background data of the athlete, and the questionnaire were sent out to the participants. To ensure that the data only reached the targeted population, the link with information about the study and the questionnaire were sent out to the players through the teams own closed forums on social media, published by the team’s contact person. To ensure that the data were authentic, players could only fill in the survey once. The participants were informed about their confidentiality, that participation was voluntary and that they had the opportunity at any time to cancel their participation without giving cause while answering to the questionnaire. They were also informed that the data gathered would be presented anonymously in a master’s project, and possibly in a scientific article. Only approved researchers had access to the collected material and that the ethical considerations were in accordance with the research ethics act. To ensure that the participants had read the information they had to give their written consent to be a part of the study. The data collection was made fully anonymously online, through the platform Qualtrics. Two reminders to the teams that had volunteered to participate into the study were sent out to the teams contact persons during the data collection period. The contact persons were informed that the reason was to get a higher response rate by reminding the players to answer the survey. First reminder was sent out one week after accepting participation in the study and the second reminder two weeks after accepting participation.

2.4 Data analysis

To answer the research questions the scores of the modified Swedish CSAI-2R was divided into the different subscales: cognitive anxiety, somatic anxiety and self-confidence. Since only psychometric properties of the intensity scale in the Swedish version of the CSAI-2R has

been tested (Lundqvist & Hassmén, 2005), and in this study the directional scale was added, further testing of the psychometric properties was of importance to assure an acceptable internal consistency and model fit for all the subscales. Cronbach's alpha was calculated on the items that form each subscale to test the internal consistency reliability, where a value higher than .7 was acceptable. The relationship between the dimensions of the modified Swedish CSAI-2R was verified through the coefficients of Spearman's correlation.

The first research question, how elite female floorball players experienced competitive anxiety was described with descriptive statistics regarding both intensity and whether the athletes experienced competitive anxiety as positive or negative in association to the floorball game. The second research question, if there a difference in competitive anxiety, between experienced elite female floorball players compared with less experienced elite female floorball players prior to a floorball game, was calculated with multivariate analyses of variance (MANOVA). Follow-up univariate analyses of variance were conducted for significant effects. The third research question, whether it is possible to predict playing time during the previous floorball game based on the different competitive anxiety subscales, was tested with a multiple regression analysis. Multicollinearity was tested to predict if variables were to highly intercorrelated, where a value less than .8 was acceptable. The significance level was set at $p < .05$. Mean scores and standard deviations were expressed as $(M \pm SD)$.

3. Results

3.1 Reliability and intercorrelation analysis

Internal consistency reliability for the items on each subscale of the modified Swedish CSAI-2R was tested with Cronbach's alpha, the results showed that each subscale was reliable (Table 2). The premises for multicollinearity was not violated.

The correlation coefficients for the intensity subscales were all significant. Cognitive anxiety showed a positive correlation with somatic anxiety ($r = .57, p < .001$). Whereas, self-confidence showed a negative correlation with both cognitive anxiety ($r = -.72, p < .001$) and somatic anxiety ($r = -.48, p < .001$).

For the directional scale, the correlation coefficient between cognitive and somatic anxiety showed a positive significant correlation ($r = .53, p < .001$). Moreover, self-confidence showed a negative correlation between cognitive ($r = -.08, p = .94$) and somatic anxiety ($r = -.78, p = .49$), and no significant correlation.

When combining the directional and intensity scale, self-confidence intensity showed a positive significant correlation with cognitive direction ($r = .41, p < .001$) and self-confidence direction ($r = .50, p < .001$). Cognitive intensity showed a significant negative correlation with cognitive direction ($r = -.43, p < .001$) and self-confidence direction ($r = -.33, p < .01$). Somatic intensity showed a negative significant correlation with self-confidence direction ($r = -.25, p < .05$). No significant correlations were found between somatic intensity and cognitive direction ($r = -.13, p = .24$) or somatic direction ($r = -.04, p = .71$), self-confidence intensity and somatic direction ($r = .10, p = .37$) or between cognitive intensity and somatic direction ($r = -.15, p = .17$). Intercorrelations of each subscale are shown in table 1.

Table 1. Intercorrelation analysis of the CSAI-2R subscales.

	Cognitive anxiety direction	Somatic anxiety intensity	Somatic anxiety direction	Self-confidence intensity	Self-confidence direction
Cognitive anxiety intensity	-.43 ***	.57***	-.15	-.72 ***	-.33 **
Cognitive anxiety direction		-.13	.53 ***	.41 ***	-.08
Somatic anxiety intensity			-.04	-.48 ***	-.25 *
Somatic anxiety direction				.10	-.78
Self-confidence intensity					.50 ***
Self-confidence direction					

*** = $p < .001$ = ** $p < .01$ = * $p < .05$.

3.2 Descriptive statistics

The rated importance of the upcoming game was (5.72 ± 1.56) and the confidence to win the upcoming game was (4.35 ± 1.36). Descriptive statistics of means and standard deviations for the CSAI-2R intensity and directional scale are shown in Table 2. Figure 2 illustrates medians and quartiles in the box plots.

Elite female floorball players rated moderate high levels of self-confidence, and anxiety levels as somewhat elevated based on intensity mean scores. Self-confidence was perceived as facilitative for performance whereas cognitive and somatic anxiety were rated as deliberative for the performance, in the total sample and both groups. The high experienced athletes rated higher self-confidence ($2.89 \pm .74$) than the less experienced athletes ($2.40 \pm .75$). Less experienced athletes perceived higher intensity of anxiety; cognitive ($2.39 \pm .89$ vs $1.75 \pm .63$) and somatic ($1.67 \pm .63$ vs $1.46 \pm .50$). Ratings of self-confidence direction was perceived equally. The high experienced athletes rated somatic anxiety direction slightly more deliberative to performance ($-.27 \pm 1.14$ vs $-.06 \pm .88$) than the less experienced athletes.

Table 2. Descriptive statistics and Cronbach α values on the CSAI-2R subscales

CSAI-2R subscales	Total sample (n=81)			High experienced (n=47)			Less experienced (n=34)		
	M	SD	α	M	SD	α	M	SD	α
Cognitive anxiety intensity	2.12	.84	.87	1.75	.63	.83	2.39	.86	.86
Cognitive anxiety direction	- 1.20	1.23	.92	- 1.22	1.21	.90	- 1.18	1.26	.87
Somatic anxiety intensity	1.58	.58	.87	1.46	.50	.83	1.67	.62	.86
Somatic anxiety direction	- .15	1.00	.89	- .27	1.14	.92	- .06	.88	.81
Self-confidence intensity	2.61	.78	.91	2.89	.74	.86	2.40	.75	.87
Self-confidence direction	1.31	1.45	.93	1.31	1.47	.89	1.31	1.46	.89

Figure 2. Median and quartile differences between groups on the modified CSAI-2R subscales

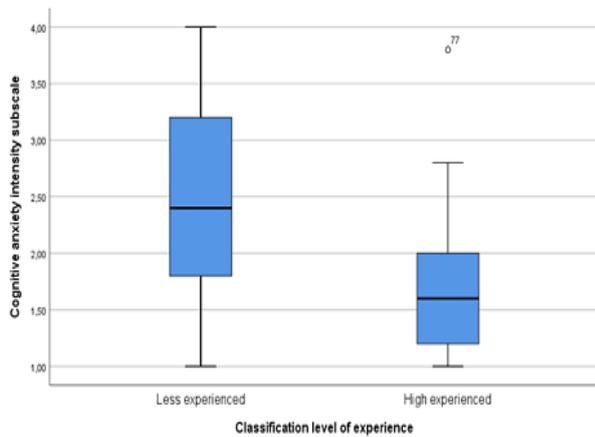


Figure 2.1. Differences between high – and less experienced elite female floorball players ratings in Cognitive anxiety intensity.

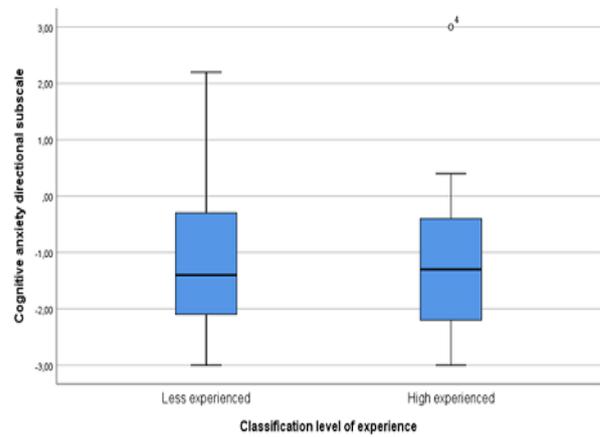


Figure 2.2. Differences between high – and less experienced elite female floorball players ratings in Cognitive anxiety direction.

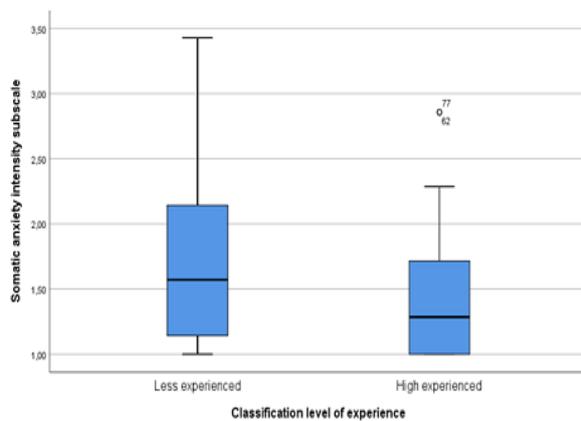


Figure 2.3. Differences between high – and less experienced elite female floorball players ratings in Somatic anxiety intensity.

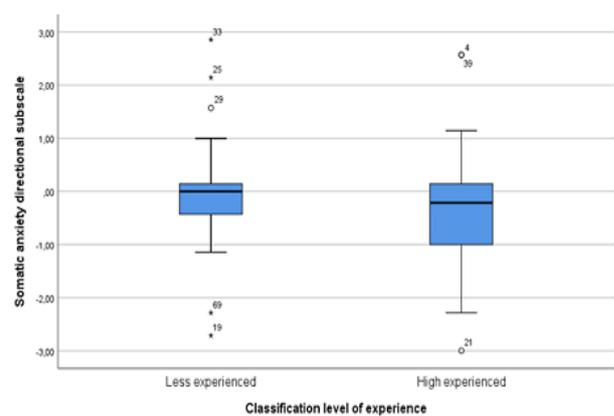


Figure 2.4. Differences between high – and less experienced elite female floorball players ratings in Somatic anxiety direction.

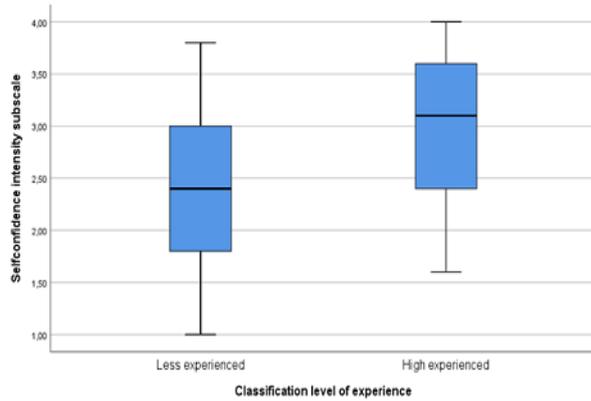


Figure 2.5. Differences between high – and less experienced elite female floorball players ratings in Self-confidence intensity.

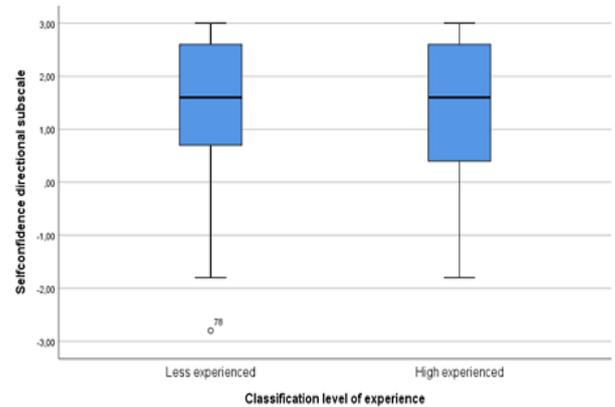


Figure 2.6. Differences between high – and less experienced elite female floorball players ratings in Self-confidence direction.

3.3 Analysis of the effect of competitive experience

Multivariate analysis of variance was conducted to establish if there were any significant differences between groups between the high and less experienced athletes, regarding the subscales on both the intensity and directional scale.

The cognitive anxiety, somatic anxiety and self-confidence intensity scores in the combined variable was significant (Wilks' lambda= .84, $F_{3,77} = 4.91$, $p < .01$). Significant differences in the separate variables cognitive intensity ($F_{1,79} = 13.59$, $p < .001$) and self-confidence ($F_{1,79} = 8.66$, $p < .01$) were shown between groups. High experienced athletes showed higher levels of self-confidence than less experienced and less experienced athletes revealed higher levels of cognitive anxiety than more experienced. No significant differences were shown in somatic intensity ($F_{1,79} = 2.57$, $p = .11$).

In cognitive anxiety, somatic anxiety and self-confidence directional scores in the combined group was not significant (Wilks' lambda= .99, $F_{3,77} = .37$, $p = .77$). No significant differences were found in cognitive anxiety ($F_{1,79} = .02$, $p = .89$), somatic anxiety ($F_{1,79} = .92$, $p = .34$) or self-confidence ($F_{1,79} = .00$, $p = .99$) between groups.

3.4 Prediction of playing time

Playing time in minutes during the previous game was (51.3 ± 16.4), for the total sample. A multiple regression analysis for the intensity scale and directional scale, showed that the overall regression equation was not significant (Table 3). Only 5 % of the variance in playing time during the previous game in elite female floorball players is explained by the combined

effect of the CSAI-2R intensity subscales. When adding game position in combination with the three directional subscales the variance increased to 7 % from 5 %. Cognitive anxiety direction was found to be significant ($p < .05$), where the higher cognitive anxiety was experienced as positive to the performance, an increase in playing time could be expected. Other predictors in the analysis showed no significance to predict playing time.

Table 3. Multiple regression analysis: Playing time during the previous floorball game in elite female floorball players, regressed on the modified CSAI-2R subscales and playing position.

	Model 1. Intensity subscales	Model 2. Intensity subscales and playing position	Model 3. Directional subscales	Model 4. Directional subscales and playing position
Competitive anxiety	- 6.12 (3.46)	-5.50 (3.51)	3.50* (1.75)	3.91* (1.75)
Somatic Anxiety	2.00 (4.06)	2.30 (4.07)	-2.22 (2.17)	-2.67 (2.16)
Self-confidence	.66 (3.16)	1.20 (3.30)	1.92 (1.24)	1.91 (1.23)
Playing position		-2.78 (2.69)		-4.50 (2.61)
Constant	59.39*** (13.72)	60.63*** (13.77)	52.65*** (3.17)	60.26*** (5.41)
N	81	81	81	81
Adjusted R ²	.05	.05	.05	.07

Unstandardized B-coefficients and standard errors in parentheses

*** = $p < .001$ = ** $p < .01$ = * $p < .05$.

4. Discussion

The findings of this study point out the importance of competitive experience as a variable affecting competitive anxiety responses in athletes. Directional responses did not differ significantly between high and less experienced elite athletes, whereas the intensity scores showed significant differences between groups in cognitive anxiety and self-confidence.

There are many factors described in the literature that affects competitive anxiety, for example: gender, age, type of sport, whether the sport is of open or closed nature and the competitive experience (Craft et al., 2003; Kleine, 1990; Rocha et al., 2018; Terry et al., 1996). To answer research question one, how female elite floorball players experienced

competitive anxiety, mean scores of ratings of both scales were compared with scores observed in previous research.

The modified CSAI-2R was used to evaluate competitive anxiety in 84 female and male elite and sub-elite young athletes competing in cross-country skiing and swimming (Lundqvist et al., 2011). When looking at the total sample at the intensity scale, the rated mean scores of self-confidence and somatic anxiety were similar with the results presented in this study, while cognitive anxiety scores were lower. One aspect could be that both male and female athletes participated, that lowered the cognitive anxiety score due to female athletes have shown to experience significant higher levels of cognitive anxiety compare to males (Fernandes et al., 2013).

In the same study by Fernandes and colleagues, 70 of 303 athletes were females, competing in various types of sports. Lower scores of cognitive anxiety and higher levels of somatic anxiety were reported in the female group, than the results presented in this study. Due to the mixed type of sports with both individual and team sports, it is difficult to interpret the results. Previous research have shown that athletes performing individual sports are more adversely affected by anxiety (Rocha et al., 2018; Terry et al., 1996). Whereas in the total sample of both female and male participants showed that those practicing individual sports reported significantly lower levels of cognitive anxiety, with no significant differences existing in somatic anxiety and self-confidence (Fernandes et al., 2013).

In a study, 72 female junior ice-hockey players, with an age from 15 up to 18, reported higher levels of cognitive and somatic anxiety than in the present study (Saadan et al., 2016). One of the inclusion criteria's in this study was to be over 18 years old to participate. There is evidence that younger athletes have higher levels of competitive anxiety, these findings to the fact that young age is directly related to factors such as feelings of insecurity, emotional dependency and use of less elaborated strategies for coping with physiological response (Rocha et al., 2018).

When observing the descriptive results of the directional scale based on the mean scores, self-confidence was perceived as facilitative for performance whereas cognitive and somatic anxiety were rated as deliberative for the performance, which is consistent with previous results (Kais & Raudsepp, 2005). This is also in agreement with the multidimensional theory of anxiety, where cognitive and somatic anxiety exhibits a negative relationship to performance and self-confidence a positive relationship to performance (Martens et al.,

1990a). In summary, directional scores was found to be similar with results previously reported, whereas some differences were found in intensity ratings when observing mean scores. One disadvantage was that there were few studies found with the similar type of sport performed and similar type of athletes participating, which may affect the comparisons made. Other factors identified to affect and elevate competitive anxiety, is perceived importance of competition and uncertainty about the outcome of competition (Martens et al., 1990b). The results showed high ratings of the importance of the upcoming game and moderate ratings of confidence to win the upcoming game. In another study, elite and sub-elite cross-country skiers rated how important the current competition to be on the same scale, were the mean score of perceived importance was similar with results reported in this study. In addition to this, elite and sub-elite swimmers rated how certain they were of reaching the finals with a similar scale and the results were as well consistent with what was found in this study (Lundqvist et al., 2011).

The null hypothesis regarding research question two, there is no difference between experienced and less experienced female elite floorball players in competitive anxiety, was partially rejected. Results in this study showed that less experienced athletes reported higher levels of competitive and somatic anxiety on the intensity scale, where a significant difference was showed in cognitive anxiety. The high experienced athletes had a significant higher amount of self-confidence at the intensity scale than the less experienced athletes. No significant results were found regarding the directional scale between groups.

The intensity results in the present study are comparable with previous research. Higher levels of competitive anxiety in athletes with less competitive experienced compered to more experienced athletes have been shown (Rocha et al., 2018). Athletes with high competitive experience report lower levels of cognitive and somatic anxiety, as well as higher levels of self-confidence, in comparison to athletes with less competitive experience (Mellalieu et al., 2004). Furthermore, another study found that athletes with a high amount of competitive experience revealed significantly higher levels of self-confidence, but no significant differences were shown in cognitive or somatic anxiety intensity (Fernandes et al., 2013).

The directional ratings differ from previously presented results, when observing competitive experience or skill level as a variable. A study evaluating elite and non-elite swimmers completed the modified CSAI-2 questionnaire (Jones et al., 1994). Elite swimmers reported significantly more facilitative scores of cognitive and somatic anxiety in relation to their

upcoming performance, than non-elite swimmers. The authors suggested that the more positive interpretation of pre-competitive symptoms is likely to be related with the fact that the elite athletes reported significantly higher levels of self-confidence.

Another study where 84 elite and sub-elite athletes participated, and completed the modified CSAI-2R, the intensity and directional subscales were measured in combined instead of separately. The results showed no significant differences between the groups in rated direction scores of cognitive or somatic anxiety at moderate to high intensity level. In low anxiety level, elite athletes rated a significant higher level of facilitative scores. The authors suggested that facilitative direction scores are a consequence of low anxiety intensity, probably combined with high levels of self-confidence (Lundqvist et al., 2011).

Interestingly, even though the less experienced athletes reported significantly higher levels of cognitive anxiety in the present study, the mean scores were rated equally between the high and less experienced athletes regarding the deliberative cognitive anxiety scores. This shows example of that athletes handle the demands of competition differently. One explanation could be that the high experienced athletes revealed a significantly higher level of self-confidence. No significant differences were found in somatic anxiety, worth observing was that even though the less experienced athletes perceived slightly higher levels of somatic anxiety intensity based on mean scores, both groups had directional mean scores close to zero. Ratings at zero are explained as neither debilitating nor facilitative for performance, which can imply that some athletes experience anxiety symptoms, but perceive the symptoms as not affecting the upcoming performance.

In research question three, if it was possible to predict playing time based on the different anxiety subscales, the null hypothesis was accepted. Pre-performance measures of anxiety to predict actual performance cannot be supported. Only one similar study was found in relation to prediction of performance related to the different subscales of the modified CSAI-2. A separate stepwise multiple regression was carried out to examine the relative predictive value of the different subscales in relationship to female gymnasts beam performance. The only significant predictor was self-confidence accounting for 8.5 % of the variance, and showing that higher levels of self-confidence were associated with better beam performance (Jones et al., 1993).

Found in the present study, only 5 respectively 7 % of the variance could be explained of the different modified CSAI-2R subscales, where cognitive anxiety direction was found to be

significant. The remaining 95 % and 93 % of variation is explained by other factors that were not measured in this study. There are many factors that can influence the performance, for example the role of the coach, the climate surrounding the athlete, team cohesion, physical characteristics and abilities, are factors found as important for the individual performance in elite athletes in team sports (Milanović et al., 2017; Pensgaard & Roberts, 2002).

Intercorrelations between intensity subscales were all significant and consistent with results found in other studies (Fernandes et al., 2013; Jones et al., 1993; Kais & Raudsepp, 2005). For the directional scale, the positive significant correlation between cognitive and somatic anxiety is as well consistent with previous results (Kais & Raudsepp, 2005). Self-confidence direction showed a non-significant negative correlation between the directional anxiety subscales, where previous results have reported a positive significant correlation (Jones et al., 1993). Also stated in the same study by Jones and colleagues, is that there is no need to measure self-confidence direction due to the high positive correlations between self-confidence intensity. Suggesting only to measure self-confidence intensity in the future.

Furthermore, when looking at intercorrelations between the combined intensity and directional scale, cognitive intensity showed a significant negative correlation with cognitive direction, which have been reported previously and showing that higher levels anxiety were associated with less favourable perceptions in terms of consequences on performance (Jones & Hanton, 2001; Kais & Raudsepp, 2005). Also supported in previous research was that there was no significant correlation between cognitive anxiety intensity and somatic anxiety direction (Jones et al., 1993; Kais & Raudsepp, 2005). Self-confidence intensity showed a positive significant correlation with cognitive direction. A positive correlation was found between self-confidence intensity and somatic direction, but no significance. This differs from previous results, where both anxiety directional scales had a significant positive correlation with self-confidence intensity (Jones et al., 1993; Kais & Raudsepp, 2005). A significant negative correlation between somatic intensity and somatic direction have been stated previously, which could not be proven as significant correlation in this study. These findings suggest that it would appear to be of value to measure these two dimensions of somatic anxiety separately. Furthermore, somatic intensity and cognitive direction was negative, but not significant in this study. Previous results have shown it be negative, both as significant and non-significant (Jones et al., 1993; Kais & Raudsepp, 2005).

One aspect that should be taken in consideration when doing self-reported measurements are the link between questionnaire response and actual behaviour. The respondents may want to

present themselves in the best light and give a positive impression, which can question the data obtained. This can particularly occur when asking about sensitive or undesirable feelings or traits (Polit & Beck, 2010). To reduce the risk, the questionnaire was filled in anonymously and the participants was informed about their confidentiality.

There are some limitations with this study. The data gathering was made electronic through internet, since the participating teams' locations were geographically spread over the whole country. In this study, 31 % of all the female elite floorball players in the highest league participated. A higher response rate could have been expected if being present when the players filled in the questionnaires. This was not optional for this study, because of limited funding and time to travel. Also worth noting, is that this study was a one-time assessment of pre-competition anxiety levels.

A higher number of participants than expected was excluded from the study. Athletes that was not playing the upcoming game, in this case 21 players, was excluded from the study since the modified CSAI-2R measurement should be filled in before competition. Research have shown that depending on when the measurement is administered in relationship to competition may affect the anxiety levels (Craft et al., 2003). The pre-competition anxiety levels have been found to be significantly higher when assessed within 1 hour before important competitions (Hanin et al., 2000). The instructions given in this study was to complete the survey before competition, how long before the competition the athletes completed the questionnaire cannot be determined, which may affect the results obtained. Furthermore, additional 20 players were excluded since they did not complete the whole questionnaire. 80 % of these answers was ended at the same place in the survey and in a row, just before being directed over to the measurement part, suspecting there was some kind of technical problem. Moreover, there was unequal distribution of athletes between the two groups, high-experienced athletes (42%) and less-experienced athletes (58%) that may have affected the comparisons made.

Furthermore, a previous study have suggested that the traditional approach of measuring intensity and directional responses separately may draw incorrect conclusions about the importance of facilitative ratings of anxiety symptoms (Lundqvist et al., 2011). When measuring the intensity and directional separately as two variables, no information about the frequency with which specific anxiety symptoms are labelled as debilitating or facilitative are revealed. Such information paired with the intensity ratings for each specific item, would provide a more comprehensive understanding of the relationship between anxiety intensity and the directional approach. Since no differences could be found in directional anxiety

ratings in this study, further research of the directional scale and its relationship to competitive anxiety is desirable.

5. Conclusion

In summary, the findings of the present study suggest that the competitive experience in female elite floorball players is of importance. Less competitive experienced athletes had higher levels of pre-competition intensity anxiety symptoms, whereas athletes with highly competitive experience had higher levels of self-confidence. No significant differences in interpretation of these symptoms in terms of consequences for performance was stated, possibly due to the high levels of self-confidence. Pre-performance measures of anxiety to predict actual performance cannot be supported. The results indicate the importance of future research of prevention and intervention programs, in elite floorball players, especially in females and those with lower competitive experience.

6. Practical applications

This study brings further knowledge of the about competitive anxiety as a psychological factor affecting elite female floorball players performance. In practical terms, coaches and athletes should be aware of the mental components and physiological elements of anxiety in relationship to competition. Furthermore, that those athletes who has a negative relationship to competitive anxiety, gets the support and resources they need. For example, contact with a mental coach or sport psychology consultant.

7. Acknowledgement

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Appendix 1 – Information sheet

Hi!

My name is Felicia Wallin and I am a physiotherapist and student at Mid Sweden University, studying the masters programme in sports science with focus on performance optimisation in elite sport. I am doing my masters project in the field of sports psychology, concentrating on competitive anxiety in female floorball players.

Since floorball is one of the largest sports in Sweden and previous research in the sport is limited, especially in the field of sports psychology, further research in this field is important. It has earlier been observed that female athletes have higher levels competitive anxiety than male athletes. Based on that knowledge, the purpose of this study is to investigate competitive anxiety in female elite floorball players using previously tested scales; the modified Swedish revised scale of the competitive State Anxiety Inventory-2

The study is intended for all women's floorball teams in the highest league in Sweden. If you are over 18 years old, you fulfil the criteria to participate in this study.

To ensure you have read the information about the study you will have to give your consent to participate in the study, before answering the web-based questionnaire. The questionnaire is filled in anonymously and takes about 10 minutes to complete. Participation in the study is voluntary and you can at any time cancel participation without giving cause, while answering the questionnaire.

After gathering all the results, the data will be analysed and presented anonymously in a master's project, and possibly in a scientific article. Only approved researchers will have access to the collected material.

If you have any questions, you are welcome to reach out to me by email:

fewa1800@student.miun.se

I am very grateful for your participation!

Best Regards

Felicia Wallin

Appendix 2 – Background data

1. Are you...?
 - a.) Female
 - b.) Male
 - c.) Other

2. How old are you?

3. How many years have you played floorball?

4. How many seasons have you played floorball in the highest league in Sweden?
(if it is your first year – write 1)

5. Have you played any floorball games for the national team at senior level?
 - a.) Yes
 - b.) No

6. What position do you play?
 - a.) Forward
 - b.) Defender
 - c.) Goalkeeper

7. During the last game, how much did you play?
(Write it in minutes. For example, if you played the whole game you write 60 minutes)

8. Will you play the upcoming game?

a.) Yes

b.) No

If answered

a.) Yes. Please, continue answering the questionnaire below.

b.) No. Thank, you for your participation!

9. How important is the upcoming game?

(Chose the appropriate number on the seven-point scale)

Not important at all 1 2 3 4 5 6 7 Very important

10. How confident are you that you will win the upcoming game?

(Chose the appropriate number on the seven-point scale)

Not confident at all 1 2 3 4 5 6 7 Very confident

Appendix 3 – Modified CSAI-2R

Directions: A number of statements that the athletes have used to describe their feelings before competition are given below. Read each statement and then chose the appropriate number to indicate how you feel right now – at this moment (from 1 “not at all” to 4 “very much so”). Then there is a rating scale from -3 to +3, estimate if you think your feeling that you just rated will be debilitating (-3) or facilitative (+3) for your performance. Chose the appropriate number on the seven-point scale. There are no right or wrong answers. Do not spend too much time on any one statement, but choose the answer which describes your feelings right now. Check that you have answered all statements on both scales!

1. I feel jittery
 2. I am concerned that I may not do as well in competition as I could
 3. My body feels tense
 4. I feel self-confident
 5. I am concerned about losing
 6. I feel tense in my stomach
 7. I am concerned about choking under pressure
 8. I am confident I can meet the challenge
 9. I am concerned about performing poorly
 10. My heart is racing
 11. I am confident about performing well
 12. I feel my stomach sinking
 13. I am concerned that others will be disappointed with my performance
 14. My hands are clammy
 15. I am confident because I mentally picture myself reaching my goal
 16. My body feels tight
 17. I am confident coming through under pressure
-

The participants responds on a four-point Likert scale that ranges from 1 “not at all”, 2 “somewhat”, 3 “moderate” and to 4 “very much so” regarding the intensity scale of each statement. For the direction scale the participants rate on a seven-point bipolar directional scale for each statement, that ranges from -3 (very debilitating for performance) to +3 (very facilitative for performance), with a mid-point of 0 (Neither debilitating nor facilitative for performance).

Appendix 4 – Scoring key Modified CSAI-2R

Cognitive anxiety: 2 + 5 + 7 + 9 + 13 (5-20) (-15 to +15)

Somatic anxiety: 1 + 3 + 6 + 10 + 12 + 14 + 16 (7-28) (-21 to +21)

Self-confidence: 4 + 8 + 11 + 15 + 17 (5-20) (-15 to +15)