

# **Nutritional practices and levels of anxiety among young sportspersons in Kerala, India**

## **Abstract**

**Introduction:** State-Trait Anxiety Inventory (STAI) and nutrition have a positive relationship, but no research has been conducted on this topic. The purpose of this study is to examine the relationship between nutritional practices and the levels of anxiety among young sportspersons in Kerala.

**Method:** A total of 183 sports professionals from Kerala were randomly selected as participants in this study (94 Males, 89 Females) ranging in age from 13 to 24 years ( $18.37 \pm 2.13$ ). Questions about nutritional practices were collected using the questionnaire method. The State-Trait Anxiety Inventory (STAI) was used for the collection of psychological data. Statistical analysis was done using descriptive statistics (mean, standard deviation), Pearson's correlation, multiple regression analysis and the Kruskal-Wallis test.

**Results:** As a result of research, it has been determined that nutritional practices and State-Trait Anxiety Inventory had a slight positive correlation and were statistically significant ( $r_{(181)} = .294$ ,  $p = .000$ ). The State-Trait Anxiety Inventory, 14.2% (26) of the sportsperson were having low anxiety, 23% (42) were having moderate anxiety and the majority of the sportspersons were having high anxiety (62.8%) was concluded that anxiety should be given more importance and needs to be addressed.

**Conclusions:** In general, sportspeople should prioritize both their physical and mental health, including adhering to healthy nutrition practices and seeking support to manage anxiety. Taking such actions will increase their likelihood of performing well and achieving their goals. It is recommended that sports professionals develop a stress management strategy and are monitored for anxiety.

**Keywords:** Nutrition, Nutritional awareness, Nutritional practices, Sportsperson, State-Trait Anxiety Inventory.

## **Introduction**

Nutrition plays a crucial role in the physical and mental well-being of sportspeople, particularly when it comes to managing anxiety and optimizing performance. Although families, teachers, and coaches have a huge influence on players' food preferences, psychological, emotional, and behavioral factors can also affect their food preferences (Birkenhead & Slater, 2015). Anxiety plays a paramount role in sports. Anxiety determines how successful he will be (Gale & Millichamp, 2011). Anxiety may either motivate athletes to perform well or interfere with their performance (Pelletier et al., 2017). Anxiety is likely greater in highly competitive sports than in relatively non-competitive sports, as participants in competitive sports are required to succeed. Anxiety is a normal part of life for humans; however, excessive anxiety can negatively affect relationships, sleep patterns, eating habits, work, school, and other aspects of one's life. As per the sources mentioned, it has been found that there is a correlation between playing time and levels of anxiety among sportspeople (Ford et al., 2017). Anxiety can have both positive and negative effects on athletic performance (Franklin et al., 2015). For example, a moderate level of anxiety may help an athlete focus and perform at their best, while excessive anxiety can lead to decreased performance and even injury. The STAI can help athletes identify their anxiety levels and work with coaches or mental health professionals to develop strategies for managing anxiety. Nutrition and the State-Trait Anxiety Inventory (STAI) can both play important roles in the performance and well-being of sportspeople. Proper nutrition is essential for athletes to perform at their best. To achieve optimal performance, it is important to consume a diet rich in carbohydrates, proteins, and fats. Conversely, poor nutrition may result in decreased muscle mass, loss of bone density and the risk of fatigue, injury, illness, or a prolonged recovery

process, resulting in a need to take time off from training (American College of Sports Medicine et al., 2000). Additionally, staying hydrated is crucial for maintaining physical and cognitive function. Many student-athletes are fully unaware of the impact nutrition can have on their mental health, due to their busy schedules and limited rest time.

Several studies have found an association between dietary choices and anxiety. The results of a study conducted in 2020 suggest that anxiety levels decrease with increased calorie intake. It was also found that poor nutrition contributes to depression in men, but that anxiety is more strongly associated with poor nutrition in women (Turnagöl et al., 2021).

There is evidence to suggest that proper nutrition can help reduce anxiety levels. Studies have shown that omega-3 fatty acids, found in foods like salmon and walnuts, may reduce anxiety symptoms (Aucoin et al., 2021). Additionally, research has shown that maintaining stable blood sugar levels by eating regular meals and snacks can help reduce feelings of anxiety.

A widely used tool for assessing trait as well as condition anxiety is the State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1983). It can be used to identify anxiety and separate it from depressive disorders in clinical settings. It is frequently employed in studies as a sign of carer anxiety (Greene et al., 2017). It is characterized by unpleasant feelings when confronted with specific situations, demands, objects, or events. This occurs when a person evaluates a threat mentally. People no longer experience anxiety when the object or situation that they perceive as threatening disappears. Anxiety at the state level refers to a condition that arises in response to a specific event (Burton, 1979).

Overall, proper nutrition and managing anxiety levels can be key components in helping sportspersons perform at their best. Athletes need to prioritize both their physical and mental health to reach their full potential. According to research, there is a substantial link between nutrition and mental health.

**Relevance of the study:**This research aims to determine how nutrition is related to the stress/anxiety of sportspersons in Kerala.

**Hypothesis:**It was hypothesised that nutritional approaches will improve state-trait anxiety among Kerala sportspersons.

**Objectives:**This study aims to look at the nutritional practices and levels of anxiety among young sportspersons in Kerala.

### **Methodology**

**Selection of Sample:**This study recruited 183 sportspeople aged 13-24 ( $18.34 \pm 2.119$ ) from several regions in Kerala, including 94 males and 89 females. On the initial visit, researchers described the study's goal to eligible participants and enabled them to ask any questions.

### **Criterion measure**

**Nutrition Practices:**In addition to questions concerning meal frequency, diet habits, and food consumption patterns, several questions regarding fluid consumption and dietary habits have also been asked.

**Tools:**To measure state anxiety to further assess its relation to nutritional practices the State-Trait Anxiety Inventory (STAI) self-questionnaire tools were used.

**State-Trait Anxiety Inventory:**Anxiety is a 40-item self-perpetuating condition that occurs in specific situations, whereas trait anxiety is general persistent anxiety that certain people suffer from. This answer is on a 4-point scale. The scoring key is simple to use. The first subscale assesses state anxiety. The second scale evaluates trait anxiety; values range from 20 to 80, with higher scores suggesting greater anxiety. The trait anxiety scale comprised 20 self-report scales, each ranging from I to 4 for a total score of 80, to assess the general tendency to be anxious as a personality trait.

**Procedure:** A State-Trait Anxiety Scale was administered to the subjects with the proper instructions. With the help of a scoring key, the data was checked and scored.

There are seven categories in the modified POMS questionnaire, which measures total mood disturbance: two of which are positive mood categories, vigour and esteem, and five of which are negative mood categories, fatigue, anger, tension, confusion, and depression. The tool scores from zero to four, with zero being "not at all" and four being "extremely". The total mood disturbance for the POMS will be calculated by adding the two positive mood categories and subtracting the five negative mood categories. POMS questionnaires are most commonly used in nutrition research to measure multiple mood states, whereas other tools measure mood states with higher activation levels. The STAI instrument measures both anxiety state and trait. Individuals' state anxiety is determined by their emotions at the time, whereas their trait anxiety is determined by their overall emotions. STAI consists of 40 questions, with 20 measuring state anxiety and 20 measuring trait anxiety. The state anxiety scale goes from one to four, with one being "not at all" and four being "very much so," whereas the trait anxiety scale extends from one to four, with one being "never" and four being "almost always." A score of 80 is obtained by adding all of the negative attributes and subtracting the positive ones. Those with low levels of anxiety score between 20 and 39, those with moderate levels of anxiety score between 40 and 59, and those with high levels of anxiety score between 60 and 80. A modified manual for scoring only the state anxiety portion of the STAI that participants of this research will use included a score out of 40 where 10 – 19 represent low anxiety, 20 – 29 represent moderate anxiety, and 30 – 40 represent high levels of anxiety. It is a great tool because it allows the isolation of state anxiety analysis to be performed since it is divided into two parts and focuses only on analyzing anxiety and no other mood states. A key advantage of this method is that it allows the analysis of "right now" anxiety, which is the best measure for analyzing how diet affects mood right now and not a general anxiety measurement that would not be helpful in this analysis.

**Statistical Analysis:**The data was analysed using descriptive statistics (mean, standard deviations (SD), frequencies, ANOVA, Pearson's correlation, multiple regression analysis, and the Kruskal Wallis test. A probability value of less than 0.05 was considered significant. The data were analysed using the Statistical Package for Social Sciences (SPSS) version 20.

## Results

**Table 1: Socio-demographic profile of young sportspersons in Kerala**

<b>Age</b>		
<b>13-16 yrs</b>	11	6.01%
<b>16-20 yrs</b>	118	64.4%
<b>20-24 yrs</b>	56	30.60%
<b>Gender</b>		
<b>Males</b>	94	51.4%
<b>Females</b>	89	48.6%
<b>Educational Qualification</b>		
<b>08-10th class</b>	3	1.63%
<b>10-12th class</b>	82	44.80%
<b>Degree</b>	97	53.0%
<b>PG</b>	1	0.54%
<b>Type of family</b>		
<b>Joint</b>	64	35%
<b>Nuclear</b>	118	64.5%
<b>Extended</b>	1	.5%
<b>Area of residence</b>		
<b>Rural</b>	118	64.5%
<b>Urban</b>	19	10.4%
<b>Coastal</b>	46	25.1%
<b>Tribal</b>	0	0%
<b>Economic Status</b>		
<b>Yellow card</b>	16	8.7%
<b>Pink Card</b>	114	62.3%
<b>Blue Card</b>	40	21.9%
<b>White Card</b>	13	7.1%

The socio-

demographic

profile of young sportspersons in Kerala is shown in Table 1. The study participants ranged in age from 13 to 24. Study participants were aged 13 to 16, 64.4%, 16 to 20, and 30.60% between 20 and 24. 6.01% were between 13 and 16, 64.4%, were between 16 to 20, and 30.60% between 20 and 24. Males constituted 51.4% and females 48.6%. There were 94 males and 89 females. There were approximately 1.63% of 8-10th grade students and 44.80% of secondary school students respectively. Degrees were attended by 53% and Postgraduate degrees by 0.54%. 64.5% of households are nuclear families, while 35% are joint families. While extended family adds .5%. The study reported that 64.5% of the 183 participants lived in rural areas, 10.4% in urban areas, and 25.1% in coastal areas. Out of 183 subjects, 8.7% fell into the yellow card category (Most economically backward section of society), 62.3% fell into the pink card category (Priority or Below Poverty Line (BPL)), 21.9% fell into the blue card category (Non – Priority subsidy or Above Poverty Line (APL)) and only 7.1% fell into the white card category (Non – Priority). [11]

**Table 2: Personal/Sports Profile of Young Sportspeople in Kerala**

PARAMETERS	TOTAL NUMBER	PERCENTAGE
<b>Sports Specialization</b>		
Cricket	10	5.5
Wrestling	2	1.1
Archery	2	1.1
Football	117	63.9
Wushu	1	.5
Handball	6	3.3
Hockey	1	.5
Netball	2	1.1
Kho-Kho	7	3.8
Athletics	21	11.5
Karate	6	3.3
Decathlon	1	.5
Judo	6	3.3
Kabbadi	1	.5
<b>Level of Participation</b>		
School	55	30.1
Inter-collegiate	7	3.8
s-district	3	1.6
District	18	9.8
State	57	31.1
Revenue	4	2.2
South	1	.5
National	37	20.2
Khelo-India	1	.5
<b>Nutrition Class</b>		
Yes	68	37.2
No	115	62.8
<b>Special Diet</b>		
Yes	24	13.1
No	159	86.8
<b>Sleep</b>		
4-6 hrs	9	4.9
6-8 hrs	85	46.4
8-10 hrs	80	43.7
10-12 hrs	9	4.8

Table 2 shows the personal/sports profile of young sportspeople in Kerala. Cricket (5.5%), Wrestling (1.1%), Archery (1.1%), Football (63.9%), Wushu (.5%), Handball (3.3%),

Hockey (0.5%), Netball (1.1%), Kho-Kho (3.8%), Athletics (11.5%), Karate (3.3%), Decathlon (.5%), Judo (3.3%), and Kabbadi (.5%) were among the specialities of the research participants. The study included 30.1% of individuals who participated in school, 3.8% in inter-collegiate, 1.6% in s-district, 9.8% in district, 31.1% in state, 2.2% in revenue, 0.5% in south, 20.2% in national, and 0.5% in Khelo-India. 37.2% of the participants attended nutrition classes, whereas 62.8% did not. According to the study, 13.1% of the 183 participants followed a specific diet, while 86.8% did not. Out of 183 participants, 4.9% slept 4-6 hours per day, 46.4% slept 6-8 hours per day, 43.7% slept 8-10 hours per day, and 4.8% slept more than 10 hours per day.

Pearson correlation of Nutritional practices and anxiety level of sportspersons was found to be positive and statistically significant ( $r = .000$ ,  $p < .001$ ). This shows that an increase in nutritional practices can decrease the anxiety level in sportspersons. It was also seen that the hydration status and anxiety level of the sportsperson were found to be positive and statistically significant ( $r=0.026$ ,  $p < .001$ ). This also shows that there is a relationship between hydration status and the anxiety level of the sportspersons.

**Table 3: Descriptive Statistics of Nutrition Practices, State-Trait Anxiety Inventory (STAI) and Nutrition Awareness of Sportspersons in Kerala**

	Meal Frequency	Food Consumption Pattern	Food Frequency Method	Fluids	Nutritional Practices	Nutrition Awareness	Dietary Habits	State-Trait Anxiety Range
<b>Mean</b>	17.34	11.75	57.41	37.15	98.12	3.99	17.05	2.49
<b>Std. Deviation</b>	4.133	8.299	8.557	9.696	76.946	1.586	5.565	0.733
<b>Median</b>	18.00	12.50	58.00	37.00	142.00	4.00	17.00	3.00

**Table 4: Correlation Analysis**

<b>N (183)</b>	<b>Meal Frequency</b>	<b>Food Consumption Pattern</b>	<b>Food Frequency Method</b>	<b>Fluids</b>	<b>Nutritional Practices</b>	<b>Nutrition Awareness</b>	<b>Dietary Habits</b>	<b>State-Trait Anxiety Range</b>
<b>Pearson Correlation</b>	-0.083	0.180	-0.107	0.165	0.294	0.081	0.124	1
<b>Sig</b>	0.267	0.014	0.150	0.026	0.000	0.278	0.095	

**State-Trait Anxiety Inventory**

<b>State-Trait Anxiety Inventory</b>	1
<b>Nutrition Awareness</b>	0.081
<b>Nutritional Practices</b>	0.294
<b>Fluids</b>	0.165
<b>Food Frequency Method</b>	-0.107
<b>Food Consumption Pattern</b>	0.180
<b>Meal Frequency</b>	-0.083
<b>Dietary Habits</b>	0.124

The hypothesis tests if nutritional practices carry a significant impact on the anxiety level of sportspersons. The dependent variable STAI was regressed on predicting variable NP to test hypothesis H1. NP significantly predicted STAI,  $F(1) = 17.168$ ,  $p < 0.001$ , which indicates that the NP can play a significant role in shaping STAI ( $b = 0.294$ ,  $p < .0001$ ). These results direct the positive effect of the NP. Moreover, the  $R^2 = 0.086$  depicts that the model explains 8.6% of the variance in STAI. The table shows the summary of the findings.

**Table 5: Regression analysis**

<b>Hypothesis</b>	<b>Regression Weights</b>	<b>Beta Coefficient</b>	<b>R2</b>	<b>F Value</b>	<b>t-value</b>	<b>P value</b>	<b>Hypothesis supported</b>
<b>H1</b>	<b>NP--STAI</b>	<b>0.117</b>	<b>0.086</b>	<b>17.168</b>	<b>4.143</b>	<b>0.000</b>	<b>Yes</b>

Note: \* $p < 0.05$ , STAI – State-Trait Anxiety Inventory, NP – Nutritional Practices

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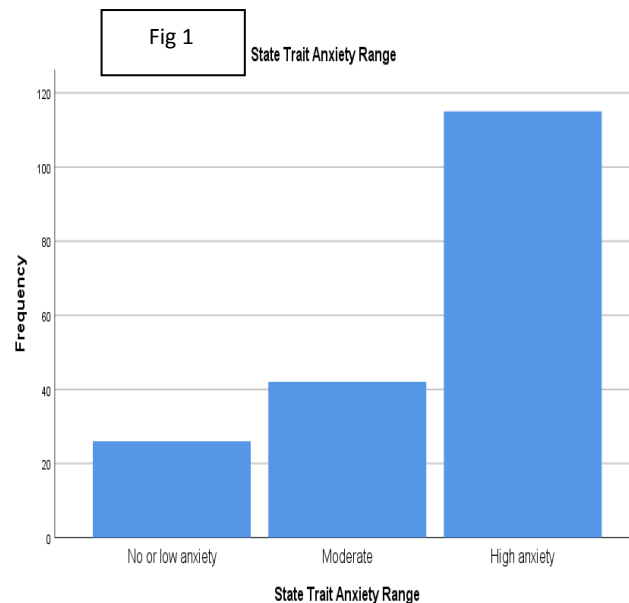
**Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	27.318	4.448		6.142	0.000
	Nutritional Practices	0.117	0.028	0.294	4.143	0.000

**a. Dependent Variable: State-Trait Anxiety Inventory**

**Table 6: State-Trait Anxiety Inventory**

State-Trait Anxiety Inventory		Frequency	Percent
Valid	No or low anxiety	26	8.7
	Moderate	42	14.0
	High Anxiety	115	38.3
	Total	183	61.0
<b>Total</b>		<b>300</b>	<b>100.0</b>



In a sample of 183 students, 14.2% showed low levels of anxiety, 23% moderate, and 62.8% severe anxiety. In comparison to male sportspersons (8%), female sportspersons had a higher percentage of low-state anxiety (18%). Both female and male athletes showed the same percentage (21%) of moderate state anxiety. The male students showed a higher percentage of high-trait anxiety (60%) than the female students (55%).

## **Discussions**

As a result of research, it has been determined that nutritional practices and State-Trait Anxiety Inventory had a slight positive correlation and were statistically significant ( $r(181)=.294$ ,  $p=.000$ ). Hydration and State-Trait Anxiety Inventory were found to be very low positively correlated and were statistically significant ( $r(181)=.165$ ,  $p=.026$ ). Nutrition awareness and State-Trait Anxiety Inventory were found to be very low positively correlated and were not statistically significant ( $r(181)=.081$ ,  $p=.278$ ). The State-Trait Anxiety Inventory, 14.2% (26) of the sportspersons had low anxiety, 23% (42) had moderate anxiety and the majority of the sportspersons had high anxiety (62.8%) was concluded that anxiety should be given more importance and needs to be addressed.

Research suggests that nutrition and anxiety are interconnected, with proper nutrition potentially helping to reduce anxiety levels. Overall, sportspersons should prioritize both their physical and mental health by adopting healthy nutritional practices and seeking support for managing anxiety levels. By doing so, they can increase their chances of performing at their best and achieving their goals.

**Strengths:** Since this is the first study to take nutrition and anxiety into consideration about young sportspersons from Kerala, this study offers a broader perspective. The topic has not been addressed previously.

**Limitations:** Only sportsperson students were selected and the number of students was one hundred and eighty-three.

## **Conclusion**

In conclusion, nutrition and anxiety are two important factors that can impact the performance and well-being of sportspersons. Proper nutrition, including a balanced diet and adequate hydration, is essential for providing the energy and nutrients needed for optimal performance. Anxiety, however, can have both positive and negative effects on athletic

performance, and athletes may benefit from tools such as the State-Trait Anxiety Inventory (STAI) to manage anxiety levels.

#### Consent

Every subject provided written informed consent before participating in the study.

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