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APPRAISE THE DISTINCTIONS IN MENTAL SKILLS AMONG ATHLETES ENGAGED IN OPEN-ENDED VERSUS CLOSED-ENDED SKILLS: A CROSS-SECTIONAL PROBE

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Study Aim: Aim of this study was to find out the differences of Mental Skills among athletes engaged in Open-Ended versus Closed-Ended Skills sports. Material and Methods: A total of one hundred one male participants (N=111), aged between 18 and 25, from universities located in the northern state of Indian, took part in the study. Furthermore, these participants were categorized into the following groups. Group-A: [Open-Ended Sports; N1=66]and Group-B: [Closed-Ended Sports; N2=45]. The Mental Skills Questionnaire developed by Hardy and Nelson (1996) is intended for gathering data on the mental skills engaged in Open-Ended versus Closed-Ended Skills sports. Statistical Techniques: A comparison of the two means was carried out using an unpaired 't'-test. All calculations and statistical analyses were performed utilizing SPSS 27. The threshold for significance in hypothesis testing was established at 0.05. Results: Results revealed that the means are not significantly different at $p < 0.05$ with regards to variable mental skills (0.2846<1.984) (viz., Imagery Ability; 0.2999<1.984, Mental Preparation; 0.4638<1.984, Self Confidence; 0.2036<1.984, Anxiety and Worry Management; 0.0715<1.984, Concentration Ability; 0.8367<1.984 and Relaxation Ability; 0.6651<1.984.

Keywords: Open-Ended Sports, Closed-Ended Sports, Imagery Ability, Mental Preparation, Self Confidence, Anxiety and Worry Management, Concentration Ability, Relaxation Ability, Mental Skills

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APPRAISE DISTINCTIONS MENTAL SKILLS AMONG ATHLETES ENGAGED OPEN ENDED VERSUS CLOSED ENDED SKILLS CROSS SECTIONAL PROBE

INTRODUCTION

The main of objective of mental skill is to prepare easy guide to use as informative, to help athletes and coaches to improve the psychological aspects of performance (Kumar & Choudhary 2020). In order to achieve peak performance athletes, need a package including physical, psychological, technical and tactical skills (Katsikas & Smirniotou 2009). Sports psychologists have proposed three relevant categories of mental skills. The first covers basic skills including goal setting, confidence and commitment. The second category involves psychosomatic skills such as response to stress, fear, relaxation and refreshment, skills that are associated with an athlete's physiological characteristics. The third category encompasses cognitive skills including visualization, mental rehearsal, focusing, refocusing and competition planning; all these involve interaction with cognitive processes, such as learning, perception, memory and thinking (Durand-Bush et al., 2001 & Gholamhossinzadeheghlidi, et al., 2016). Among the mental skills common to high performing athletes are goal setting, imagery, self-confidence and the ability to focus on performance (Orlick & Partington 1988). Psychological skills or states (self-confidence, concentration, an optimal level of arousal, etc.) Cognitive and behavioral techniques which athletes use for the purpose of achieving desirable psychological states (goal setting, self-talk, imagination, etc. (Gould & Maynard 2009). However, when discussing the psychological characteristics of successful athletes, the term mental toughness is most often used. This term has been used for more than 20 years, along with terms such as mental strength, mental preparation, mental skills, and psychological skills (Gucciardi, et al., 2015). This psychological acuity contributes to an athlete being more successful than other athletes in determination, focus, self- confidence, and stress coping (Jones, et al., 2002). To determine what mental skills, make successful athletes (Jones, et al., 2007). In the early days, coaches and athletes recognized the importance of mental states for optimal performance, but the field of sports psychological training was not flourished because of the misunderstanding that psychological skills are innate properties and lack of knowledge to train these abilities (Vealey, 1988). The ability of elite athletes to harmonize the various factors to their advantage is a major concern to the field of Sport psychology (Adeyeye, et al., 2013). Sports that involve teams of individuals will require different mental skills for each individual due to the different demands of their specific roles within the team. (Sharma, 2018). There

Are many chances for development on a personal level and for pushing the boundaries of human potential on a physical and psychological level (Sisodiya & Arora 2023).

RESEARCH DESIGN

This research was an exploratory investigation that employed a quantitative approach for both data collection and analysis. The purpose of the study was to find out the differences of Mental Skills among athletes engaged in Open-Ended versus Closed-Ended Skills sports.

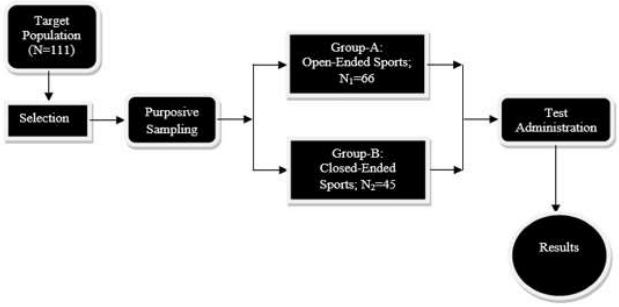

Figure-1: Study flow.

A total of one hundred one male participants (N=111), aged between 18 and 25, from universities located in the northern state of Indian, took part in the study. Furthermore, these participants were categorized into the following groups.

@Group-A: [Open-Ended Sports; N1=66]

@Group-B: [Closed-Ended Sports; N2=45]

DISTRIBUTION OF SUBJECTS

Table-1: Distribution of subjects.

Sr. No.	Sports	Sample
	[Open-Ended Sports; N1=66]	
1.	Football	24
2.	Hockey	22
3.	Volleyball	20
[Closed-Ended Sports; N2=45]		
1.	Gymnastics	16
2.	Swimming	15
3.	Archery	14

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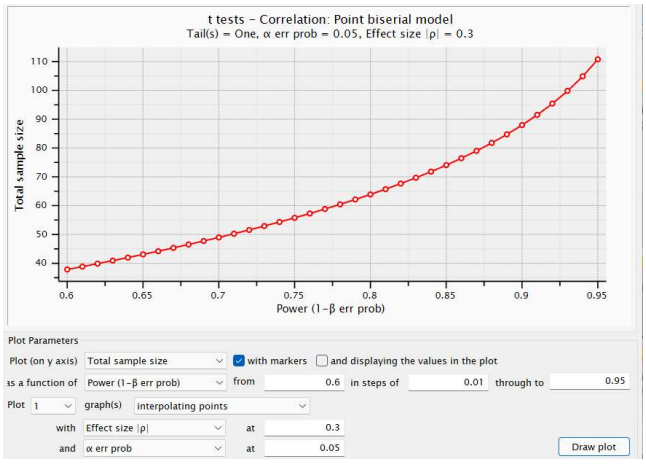
DEMOGRAPHIC PROFILE OF RESPONDENTS

A demographic profile of respondents in research constitutes a comprehensive overview of the attributes of individuals who took part in a study. This profile typically encompasses information such as the sample size, age,

Gender, group affiliation, marital status, nationality, level of participation, and associated institutions. Such details enable researchers to grasp the composition of their sample and discern possible trends or patterns within the data influenced by these factors. The following is the demographic profile of respondents: **Table-2: Demographic Profile of Respondents.**

Gender	Male	
Sample	(N=111)	
Age	18-25 Years	
Group	Open-Ended Sports	Closed-Ended Sports
Number	N1=66	N2=45
	i. Football ii. Hockey iii. Volleyball	i. Gymnastics ii. Swimming iii. Archery
Marital Status	Unmarried	
Nationality	Indian	
Level of participation	Inter-College	
Universities	o	Guru Nanak Dev University, Amritsar
	o	Punjabi University, Patiala
	o	Panjab University, Chandigarh
PROCEDURE OF SELECTING THE SAMPLE		

G*Power version 3.1.9.7 was used to analyze the power and to compute size with graphics options. G*Power was also utilized to calculate effect sizes and to visually represent the outcomes of power analyses.



SELECTION OF VARIABLES

A feasibility assessment was performed to identify the factors deemed suitable for investigation, considering the tool accessibility, subject adequacy, testing time availability and overarching research goals. The experts were consulted in determining the adoption of unitary and integrated factors. In light of the aforementioned factors, the subsequent criteria were applied in the selection of variables for the present study.

01. Imagery Ability

02. Mental Preparation

- Self Confidence

01. Anxiety and Worry Management

02. Concentration Ability

03. Relaxation Ability

- Mental Skills (Total)

SELECTION OF TOOLS

When selecting research tools, the most important factors to consider are the specific research objectives, context, available resources, and the need to maximize data quality and efficiency; choosing the right tool depends on whether your research is qualitative or quantitative, and the type of data you need to collect, such as through surveys, interviews, observations, or analysis software. The tools listed below were chosen for this study.

Table-3: Selection of tools.

Tools	Author	Year
Mental Skills Questionnaire	Hardy and Nelson	1996

DESCRIPTION OF THE VARIABLES

The Mental Skills Questionnaire developed by Hardy and Nelson (1996) is intended for gathering data on the mental skills engaged in Open-Ended versus Closed-Ended Skills sports. In accordance with the study's goals, following mental skills will be chosen for inclusion in the research.

01. Imagery Ability

02. Mental Preparation

- Self Confidence

01. Anxiety and Worry Management

02. Concentration Ability

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01. Relaxation Ability

- Mental Skills (Total)

SAMPLING DESIGN AND PROCEDURE

A sample is defined as a subset of individuals chosen from a larger population of interest, and in many cases, sampling is more feasible than conducting research on the entire population. Although it is not possible to guarantee that any sample will be entirely representative, it can still yield results that mirror the characteristics of the broader population without the need to survey every individual. In this research, a purposive sampling technique was employed to select participants. This method is characterized by its lower precision, as it involves selecting the most readily available subjects. Additionally, it represents the most economical choice for researchers regarding time, effort, and financial resources.

RESEARCH APPROACH

This research employs a quantitative research methodology, which allows for the concurrent analysis of quantitative data. The quantitative approach was primarily employed during the course of the study. Furthermore, qualitative data collection was integrated through comment sections in a largely close- ended questionnaire, allowing participants to offer additional insights that enhance the quantitative findings.

STATISTICAL TECHNIQUE

- **G*Power version 3.1.9.7.** The analysis of power and the computation of sample size with graphical options were conducted using G*Power version 1.9.7. Within the realm of data analysis, an examination of the data was undertaken through the utilization of descriptive statistics and graphical analysis.
- **Descriptive Statistics:** Fundamental characteristics of the data were compiled, encompassing measures of central tendency (mean) and variability (standard deviation), as well as the maximum and minimum values This analysis offered a comprehensive overview of the trends and variations present within the dataset.
- **Unpaired 't'-test.** A comparison of the two means was carried out using an unpaired 't'-test.
- **SPSS 27:** All calculations and statistical analyses were performed utilizing SPSS 27. The threshold for significance in hypothesis testing was established at 0.05.

DATA ANALYSIS

After the data collection was completed, the researcher performed a quantitative analysis utilizing the responses gathered from the participants. A systematic approach was adopted to analyze the research data, which is detailed in the following steps.

- **Data:** The responses submitted by the participants were analyzed and assessed in alignment with the information collected from the
- **Testing instruments:** The research scholar assessed the instrument for both validity and reliability before utilizing it for measurement
- **Measuring Variables:** There were three variables used in this study, namely, Mental Skills.
- **Test the hypothesis:** It was hypothesized that there would be significant differences of Mental Skills among Racket games and Combat sports players among Athletes Engaged In Open-Ended versus Closed-Ended
- **Level of significance:** The significance level in research indicates the probability that a result is due to influences other than random This is often denoted as the alpha (α) value. In the current study, a significance level of 0.05 was chosen.

SWOT ANALYSIS

A SWOT analysis included in a research thesis functions as a strategic planning tool aimed at identifying and evaluating the Strengths, Weaknesses, Opportunities, and Threats related to the research topic. This instrument assists the researcher in understanding the internal and external factors that could impact the study's success and the possible implications of their results, thus

Enabling a more comprehensive and informed exploration of the research area. The researcher presented a succinct SWOT analysis.

Table-4: SWOT analysis.

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Sr.No.	SWOT	Inferences
1.	Strengths	The findings of this study may improve the comprehension of the selected factors among a diverse range of stakeholders, such as sports psychologists, athletes, coaches, trainers, educators, and physical education instructors, in relation to the following aspects: Mental Skill: o Imagery Ability o Mental Preparation o Self Confidence o Anxiety and Worry Management o Concentration Ability o Relaxation Ability
2.	Weaknesses	The current investigation is limited as questionnaires do not allow the researcher to delve deeper into and elucidate topics.
3.	Opportunities	Investigating psychological components will uncover a novel and intriguing domain that necessitates comprehensive scientific research.
4.	Threats	The researcher fails to consider additional factors, including individual preferences, attitudes, levels of cooperation, household composition, socioeconomic status, cultural influences, religious beliefs, educational background, and dietary habits.
ETHICAL CONSIDERATIONS		

Ethical considerations in a research thesis involve various essential components, including confidentiality, anonymity, and voluntary participation. These elements work together to guarantee that research is conducted with appropriate respect for the rights and well-being of participants, while also maintaining the integrity of the research process. This study has duly acknowledged ethical considerations. During the collection and presentation of research materials, the researcher follows these guiding principles.

&Integrity

&Dignity

&Autonomy

&Confidentiality

&Responsibility

&Competence

&Justice and Privacy

RESULTS

Table-5: Descriptive Statistics of Open-Ended Skill Sports.

		Descriptive Statistics of Open-Ended Skill Sports						
		Imagery Ability	Mental Preparation	Self Confidence	Anxiety and Worry Management	Concentration Ability	Relaxation Ability	Mental Skills
Minimum	min =	4	4	4	4	4	4	55
Maximum	max =	23	31	24	22	22	23	108
Range	R =	19	27	20	18	18	19	53
Size	n =	66	66	66	66	66	66	66
Sum	sum =	889	968	910	891	875	785	5318
Mean	$\bar{x}$	13.469	14.667	13.787	13.5	13.257	11.893	80.575
Median	$\tilde{x}$	14	14.5	13.5	13	14	12	81.5
Standard Deviation	s =	5.660	6.393	5.978	5.480	5.714	4.867	12.372
Variance	s2 =	32.037	40.871	35.738	30.038	32.655	23.696	153.078
Mid-Range	MR =	13.5	17.5	14	13	13	13.5	81.5
Interquartile Range	IQR =	10	10	11	8	9	6	18
Sum of Squares	SS =	2082.439	2656.666	2323.03	1952.5	2122.621	1540.257	9950.121
Mean Absolute Deviation	MAD =	4.788	5.363	5.212	4.545	4.809	3.812	10.116
Root Mean Square	RMS =	14.594	15.980	15.010	14.55	14.419	12.837	81.505
Std Error of Mean	SE$\bar{x}$	0.696	0.786	0.735	0.674	0.703	0.599	1.5229
Skewness	γ1 =	-0.116	0.067	-0.208	0.006	-0.166	0.271	-0.036
Kurtosis	β2 =	2.027	2.590	1.900	2.090	2.019	2.686	2.613
Coefficient of Variation	CV =	0.420	0.435	0.4335	0.405	0.431	0.409	0.153
Relative Standard Deviation	RSD =	42.021%	43.589%	43.358%	40.598%	43.103%	40.927	15.355

Table-6: Descriptive Statistics of Closed-Ended Skill Sports

APPRAISE DISTINCTIONS MENTAL SKILLS AMONG ATHLETES ENGAGED OPEN ENDED VERSUS CLOSED ENDED SKILLS CROSS SECTIONAL PROBE

	Descriptive Statistics of Closed-Ended Skill Sports							
		Imagery Ability	Mental Preparation	Self Confidence	Anxiety and Worry Management	Concentration Ability	Relaxation Ability	Mental Skills
Minimum	min =	4	4	4	4	4	4	55
Maximum	max =	23	31	22	22	22	23	108
Range	R =	19	27	18	18	18	19	53
Size	n =	45	45	45	45	45	45	45
Sum	sum =	621	634	610	611	556	564	3596
Mean	$\bar{x}$	13.8	14.08	13.55	13.57	12.355	12.533	79.911
Median	$\tilde{x}$	14	13	13	13	12	12	81
Standard Deviation	s =	5.879	6.663	5.925	5.956	5.494	5.233	11.914
Variance	s2 =	34.572	44.401	35.116	35.47	30.188	27.390	141.946
Mid-Range	MR =	13.5	17.5	13	13	13	13.5	81.5
Interquartile Range	IQR =	10.5	12	11	11.5	9	8	16.5
Sum of Squares	SS=	1521.2	1953.644	1545.111	1560.977	1328.311	1205.2	6245.64
Mean Absolute Deviation	MAD =	5.093	5.480	5.101	5.035	4.541	4.213	9.609
Root Mean Square	RMS =	14.974	15.553	14.767	14.800	13.497	13.559	80.774
Std Error of Mean	SEx̄	0.876	0.993	0.883	0.887	0.819	0.780	1.776
Skewness	γ1 =	-0.138	0.387	-0.210	-0.058	0.036	0.173	0.066
Kurtosis	β2 =	1.973	2.899	1.969	1.957	2.257	2.462	2.961
Coefficient of Variation	CV =	0.426	0.472	0.437	0.438	0.444	0.417	0.149
Relative Standard Deviation	RSD =	42.607%	47.295%	43.715%	43.867%	44.469%	41.757%	14.909

Table-7: Unpaired t-test statistics of athletes engaged in Open-Ended Versus Closed-Ended Skills concerning Imagery Ability.

Imagery Ability		
	Open-Ended Skill Sports	Closed-Ended Skill Sports
Mean	13.4697	13.8
Variance	31.5521	33.8044
Stand. Dev.	5.6171	5.8142
N	66	45
T	0.2999	
d. o. f	109	
critical value	1.984	
since | t | < criticall value	☐	no sig. diff.

O The absolute value of the calculated *t* is smaller than critical value (0.2999<1.984), so the means are not significantly different. at p < 0.05.

Table-8: Unpaired t-test statistics of athletes engaged in Open-Ended Versus Closed-Ended Skills concerning Mental Preparation.

Mental Preparation		
	Open-Ended Skill Sports	Closed-Ended Skill Sports
Mean	14.6667	14.0889
Variance	40.2525	43.4143
Stand. Dev.	6.3445	6.589
N	66	45
T	0.4638	
d. o. f	109	
critical value	1.984	
since t < criticall value	☐	no sig. diff.

O The calculated *t* value is smaller than critical value (0.4638<1.984), so the means are not significantly different at p < 0.05.

Table-9: Unpaired t-test statistics of athletes engaged in Open-Ended Versus Closed-Ended Skills concerning Self Confidence.

Self Confidence		
	Open-Ended Skill Sports	Closed-Ended Skill Sports
Mean	13.7879	13.5556
Variance	35.1974	34.3358
Stand. Dev.	5.9327	5.8597
N	66	45
T	0.2036	
d. o. f	109	

critical value	1.984	
since t < criticall value	□	no sig. diff.

O The calculated *t* value is smaller than critical value (0.2036<1.984), so the means are not significantly different at p < 0.05.

Table-10: Unpaired t-test statistics of athletes engaged in Open-Ended Versus Closed-Ended Skills concerning Anxiety and Worry Management.

Anxiety and Worry Management		
	Open-Ended Skill Sports	Closed-Ended Skill Sports
Mean	13.5	13.5778
Variance	29.5833	34.6884
Stand. Dev.	5.4391	5.8897
N	66	45
T	0.0715	
d. o. f	109	
critical value	1.984	
since | t | < criticall value	□	no sig. diff.

O The absolute value of the calculated *t* is smaller than critical value (0.0715<1.984), so the means are not significantly different at p < 0.05.

Table-11: Unpaired t-test statistics of athletes engaged in Open-Ended Versus Closed-Ended Skills concerning Concentration Ability.

Concentration Ability		
	Open-Ended Skill Sports	Closed-Ended Skill Sports
Mean	13.2576	12.3556
Variance	32.1609	29.518
Stand. Dev.	5.6711	5.433
n	66	45
t	0.8367	
d. o. f	109	
critical value	1.984	
since t < criticall value	□	no sig. diff.

O The calculated *t* value is smaller than critical value (0.8367<1.984), so the means are not significantly different at p < 0.05.

Table-12: Unpaired t-test statistics of athletes engaged in Open-Ended Versus Closed-Ended Skills concerning Relaxation Ability.

Relaxation Ability		
	Open-Ended Skill Sports	Closed-Ended Skill Sports
Mean	11.8939	12.5333
Variance	23.3372	26.7822
Stand. Dev.	4.8309	5.1752
N	66	45
T	0.6651	
d. o. f	109	
critical value	1.984	
since | t | < criticall value	□	no sig. diff.

O The absolute value of the calculated *t* is smaller than critical value (0.6651<1.984), so the means are not significantly different at p < 0.05.

Table-13: Unpaired t-test statistics of athletes engaged in Open-Ended Versus Closed-Ended Skills concerning Mental Skills.

Mental Skills		
	Open-Ended Skill Sports	Closed-Ended Skill Sports
Mean	80.5758	79.9111
Variance	150.7594	138.7921
Stand. Dev.	12.2784	11.781
N	66	45
T	0.2846	
d. o. f	109	
critical value	1.984	
since t < criticall value	□	no sig. diff.

O The calculated *t* value is smaller than critical value (0.2846<1.984), so the means are not significantly different at p < 0.05.

TESTING OF HYPOTHESES

It was hypothesized that there would be no significant differences in mental skills among athletes engaged in open-ended versus closed-ended skills. The findings indicated that there is no significant difference in the means at p <

0.05 concerning mental skills among athletes engaged in open-ended versus closed-ended skills.

CONCLUSIONS

Results revealed that the means are not significantly different at p < 0.05 with regards to variable mental skills (0.2846<1.984) (viz., Imagery Ability; 0.2999<1.984, Mental Preparation; 0.4638<1.984, Self Confidence; 0.2036<1.984, Anxiety and Worry Management;

0.0715<1.984, Concentration Ability; 0.8367<1.984 and Relaxation Ability; 0.6651<1.984.

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