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# Relationship Between Morphological Parameter and Physical Fitness Among Mallakhamb Players

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#### Abstract

The purpose of this study was to analyse the relationship between morphological parameter and physical fitness among mallakhamb player. For this study descriptive correlation method was used. For population this study (N=119) subject were selected by purposive sampling technique, those are playing mallakhamb according to the mallakhamb federation of India spend 8 hour or more hour per week age between 18 to 25 in mallakhamb. For the measuring variable, morphological parameter such as (height, arm length, palm length, wrist circumference) assess by the Gulick tape. Grip dynamometer and 1 min sit up test was used to assess physical fitness component (grip strength and abdominal strength) respectively. Descriptive statistics of the morphological parameter such as height, arm length, wrist circumference mean was (165.27, 57.52, 18.55, 17.02) and std. deviation was (8.12, 4.40, 0.83, 9.11) respectively. physical fitness component such as abdominal strength & grip strength mean was (42.75 & 34.39) and std. deviation was (6.15, 5.65) respectively. Correlation among mallakhamb player revealed that there is significant relationship between height and abdominal strength (r = .314\*\* and p = .001) and arm length and grip strength (r = .196\* and p = .033) respectively. But there was no significant relationship between palm length & grip strength (r = .114 and p = .216) and wrist circumference & grip strength (r = .066 and p = .477) respectively.

Keywords: Height, abdominal strength, arm length, palm length, wrist circumference, mallakhamb player

### 1. INTRODUCTION

In the realm of traditional Indian sports, Mallakhamb stands out as a unique discipline demanding exceptional strength, flexibility, coordination, and control. As a sport performed against gravity, it requires a harmonious blend of physical and morphological traits for optimal performance. The relationship between an athlete's physical structure and fitness capabilities is of paramount importance in determining their success in this demanding sport. This study aims to investigate the correlation between specific morphological parameters such as (palm length, wrist circumference, arm length, and height) and physical fitness components like (grip strength and abdominal strength) among Mallakhamb players from Maharashtra.

Morphological characteristics significantly influence the ability to generate power, maintain balance, and execute precise movements, all essential for Mallakhamb. For instance, grip strength is likely affected by



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palm length, wrist circumference, and arm length, while abdominal strength, vital for core stability and control on the pole or rope, may be closely related to the athlete's height. By exploring these correlations, the study seeks to identify key physical traits that can inform selection, training, and performance enhancement strategies.

Physical fitness and morphological build have long been considered essential in enhancing performance in various sports. In Mallakhamb, grip strength is crucial for holding and manoeuvring on the apparatus and is likely influenced by upper limb dimensions. Similarly, abdominal strength, vital for core stability, posture control, and dynamic movements, may be associated with an individual's height. Understanding these correlations can aid in talent identification, scientific training, and performance optimization The purpose of this research is to explore how specific body measurements relate to key physical fitness abilities. This may guide coaches, physical educators, and sports scientists in developing personalized training strategies based on athletes' morphological profiles. Additionally, the findings can contribute to the growing body of knowledge in sports science, especially in the context of indigenous sports like Mallakhamb, where scientific investigation is still emerging.

### 2. Materials and Method

Participants: The population for this study was selected by purposive sampling technique. Those are playing mallakhamb according to the mallakhamb federation of India spend 8 hour or more hour per week in mallakhamb from past 1 year age between 18 to 25 from Maharashtra was used to study the relationship between morphological parameters and physical fitness among mallakhamb players.

Variable and tools: For the study of relationship between morphological parameter and physical fitness among mallakhamb players. In morphological parameters to assess the height, arm length, wrist circumference and Palm Length of participant Gulick tape was used. In physical fitness to assess the grip strength of participant grip dynamometer was used. To assess the abdominal strength of participant lminute sit up test was used. Variables was selected as independent variables and tested by standardized procedure.

Procedure: The data collection began after getting formal permission from several well-known Mallakhamb academies in Maharashtra. On the scheduled practice days, the researcher explained the purpose of the study to the players and clearly described the steps involved. The data were collected from the participants using standard methods to make sure the process was fair and accurate. After collecting the data, it was organized and analyzed using simple statistical tools like descriptive statistics. Pearson's correlation method was also used to find the relationship between the players' body measurements (morphological parameters) and their physical fitness levels. The resulting outcomes were interpreted to identify significant correlations and emerging patterns within the dataset.

#### 3. Result:

 Table No. 01 Descriptive Statistics of Morphological Parameter and Physical Fitness

 Among Mallakhamb Player

N = 119	Height	Arm	Wrist	Palm	Abdominal	Grip
		Length	Circumference	Length	Strength	Strength
Mean	165.27	57.53	17.03	18.56	42.75	34.39
Std. Error of Mean	0.74	0.40	0.84	0.08	0.52	0.56



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Std. Deviation	8.12	4.40	9.11	0.83	5.65	6.15

# Table No. 02 Correlation Between of Morphological Parameter and Physical Fitness Among Mallakhamb Player

N=119	HEIGHT & ABDOMINAL STRENGTH	ARM LENGTH & GRIP STRENGTH	PALM LENGTH & GRIP STRENGTH	WRIST CIRCUMFERENCE & GRIP STRENGTH
Pearson Correlation	.314**	.196*	.114	066
Sig. (2 tailed)	.001	.033	.216	.477

In the above-mentioned Table No.1, The means and standard deviations of the height 165.27 ( $\pm 8.12$ ), arm length 57.53 ( $\pm 4.40$ ), wrist circumference 17.03 ( $\pm 9.11$ ), palm length 18.56 ( $\pm 0.83$ ), abdominal strength 42.75 ( $\pm 5.56$ ), and grip strength 34.39 (6.15) respectively.

In the above-mentioned Table No.2, The correlation between of morphological parameter and physical fitness among mallakhamb player Pearson correlation coefficient was calculated. The calculated coefficient of correlation which shows there is significant correlation exist between height and abdominal strength (p=0.001), arm length and grip strength (0.033) at 0.05 level of significance. While palm length and grip strength (p=.216), wrist width and grip strength (p=.477), shows no significant correlation at 0.05 level of significance, respectively.

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