

# Role of Nano Technology in Facilitating Performance Among Swimmers

Dr. A M Manjunatha<sup>1</sup> and Dr. Kumaraswamy<sup>2</sup>

<sup>1</sup>Tumkur University, Dept. Of Physical Education, Tumkur, India, manjunathmithra@gmail.com

<sup>2</sup>Physical Education Director, Don Boco Institute of Technology, Bangalore, kumaraped@gmail.com

## I. INTRODUCTION

Nanotechnology is basically manipulation of matter on an automatic, molecular and supra molecular scale. It can be defined as manipulation of matter with at least one dimension sized form one to hundred nano meters. Today research in nano technology deals with special properties of matter that occurs below the given size threshold. It is very broad field including field of size. As the application of nanotechnology spreads out to various fields, sports also was influenced by its application and when we think of swimming it is undisputedly evident how and to what extent it can influence an individual's performance. It came under scanner when Michael Phelps won 8 gold medals and 7 world records in 2008 Olympics and 25 others also broke the world records. 168 world records were broken by competitive swimmers wearing nano technology aided costumes from 2008 Beijing Olympics to 2010.

The newly developed swim suit aided with nano technology repels the water and dries up very quickly. It helps the swimmer by not carrying the extra air/water next to skin helping him to reduce the time. The swim suit traps air and compresses the body which in turn increases the buoyancy- the float and reduces the drag. Nano technology aided costume is created by building an invisible mesh around every fabric lining without interfering with its weaving and repels water without absorbing it. These fabrics are also preferred as they offer many basic benefits such as performance enhancement, enjoyable, reduces injury it also aids other benefits such as- ultimate comfort, designed with SPF factor, harmless to skin and are non toxic.

## II. OBJECTIVE OF THIS PAPER

This paper aims to analyze the effect of nanotechnology in designing swimming costumes which in turn is facilitating better performance among swimmers.

## III. HYPOTHESIS

It was hypothesized that the costume designed with nano technology aids swimming performance.

It was hypothesized that there would be significant difference as per the t-test at 0.05 level of significance among the mean scores of competitor's timings with nano technology based costume and regular practice costumes.

#### IV. LIMITATION

Study not conducted for all types of events in swimming is one of the major limitations. Small sample size selected is also one of the limitations.

#### V. DELIMITATIONS

The study is delimited to 20 swimmers in 100m event. Data is collected from competitive swimmers of only one particular swimming coaching centre.

#### VI. METHODOLOGY

A survey was conducted among 20 competitive swimmers to analyze whether difference in costume material would influence their performance in swimming. Data was collected twice from competitors after regular warm up in the evening session of Saturday- one wearing the regular costume and after proper recovery period of rest, timings is also taken with the costume designed with nano technology called as jammers. These costumes were all FINA approved ones.

The data obtained was statistically treated to get the average scores, standard deviations and significant difference between the averages were established at 0.05 level of significance of the T-test.

#### VII. RESULTS OF THE STUDY

100m freestyle:

TABLE I.

VARIABLES	MEAN	STANDARD DEVIATION	T- TEST SCORES
With regular costume	1.23	0.3284	4.517*
With jammers	1.21	0.2695	

When the timings of competitive swimmers in the 100m free style event, with regular costumes used for practice purpose and with competition costume, that is the jammers or nano technology based costume, the average scores were 1m,23secs,95 mil sec and 1m, 21 secs 92 mil sec with standard deviation of 0.3284 and 0.2695 respectively. But the time taken was considered to nearest second. The significant difference among the scores at 0.05 level of significance as per the T-test was 4.517\*

#### VIII. DISCUSSION ON FINDINGS

It can be observed that there is significant difference as per the T-test at 0.05 level hence the hypothesis stating that there would be significant difference as per the t-test at 0.05 level of significance among the mean scores of competitor's timings with nano technology based costume and regular practice costumes can be accepted.

Since the time taken by the swimmers by wearing the nano technology costume were considerably reduced the hypothesis stating the costume designed with nano technology aids swimming performance can also be accepted.

#### IX. CONCLUSION

Performance in swimming is collective contribution of various aspects such as physical, physiological and psychological make of an individual, training pattern, nutrition and others but winners in swimming are decided through differences in fraction of second and the costume design with the aid of nanotechnology definitely influences the performance and contributes both psychologically and physically to have an edge at least by fractions of a second which is a welcome note in swimming. Even reduction of fraction of second in

swimming is still a major contribution for the performances as every single 100<sup>th</sup> fraction of sec determines a winner in swimming competitions.

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