**EFFECTIVENESS OF HANDBALL TRAINING ON THE BASIS OF HEALTH-RELATED PHYSICAL FITNESS AND ACHIEVEMENT MOTIVATION OF SCHOOL STUDENTS OF MUMBAI**

**A Dissertation Submitted to University of Mumbai**

**For the Partial Fulfillment of the Degree**

**of Master of Physical Education**

**SUBMITTED BY**

**PRIYANKA CHINTAMAN MEHER**

**UNDER THE GUIDANCE OF**

**DR. SUSHAMA N. CHOUGULE**

**Bombay Physical Culture Association’s**

**College of Physical Education**

**Bhartiya Krida Mandir,**

**Wadala, Mumbai-31.**

**Maharashtra.**

**July, 2020.**

**CERTIFICATE**

(As required by the University Regulation No - 4283)

This is to certify that **Miss. Priyanka Chintaman Meher** has completed this dissertation work entitled, ***“Effectiveness Of Handball Training On The Basis Of Health Related Physical Fitness And Achievement Motivation Of School Students Of Mumbai’’*** under the guidance and supervision of **Dr. Sushama N. Chougule**

Further this work is candidate’s own work and has not been submitted for any other Degree of this or any other University as well as is worthy of examination.

**Certified by**

|  |  |  |
| --- | --- | --- |
| **Signature of the Guide**  (Dr. Sushama N. Chougule.) | **Signature of the**  **Head of Institute**  (Dr. G.V.Pargaonkar) | **Signature of the Candidate**  (Priyanka Chintaman Meher) |
|  |  |  |

Date:

**PREFACE**

Physical Education has been accepted as an integral part of general education in India.

There is great scope and need for research in Physical Education applying the training of Handball Training On The Basis Of Health Related Physical Fitness and Achievement Motivation of School Students of Mumbai

The review of literature does not indicate any studies to evaluate the effectiveness of Handball Training On The Basis Of Health Related Physical Fitness and Achievement Motivation of School Students of Mumbai

The Present study is aimed at collecting the scientific evidence about the effectiveness of Handball Training On The Basis Of Health Related Physical Fitness and Achievement Motivation of School Students of Mumbai

It is hoped that the results of the present study may be helpful to those who are interested in the applied aspects of effectiveness of Handball Training On The Basis Of Health Related Physical Fitness and Achievement Motivation of School Students of Mumbai

.

July, 2020 **Priyanka Chintaman Meher**

(Research Scholar)

**ACKNOWLEDGEMENT**

I express my deep sense of gratitude and sincere thanks to my supervisor and guide Dr. Sushma N. Chougule, Associate Professor of Bombay Physical Culture Association’s College of Physical Education, Wadala, Mumbai for her sincere cooperation, constant guidance, encouragement, sympathetic and inspiring attitude that facilitated the accomplishment of this work.

I wish to record my sincere feeling of gratitude to Dr. G. V. Pargaonkar, Principal, B. P. C. A.’S College of Physical Education, Wadala, Mumbai – 400031 for his constant inspiration, sympathetic attitude, critical comments, concrete suggestions, untiring pains and keen interest throughout the tenure of present investigation.

In this arduous and challenging journey of mine, I have also been supported and guided by many benevolent people to whom I would like to express my heartfelt gratitude. I would like to take the opportunity to express my profound sense of gratitude and respect to Dr. R.R. Dhakne, Dr. G.K. Dhokrat, Dr. N. O. Joshi, Dr. K. J. Maru, and our College Librarian Smt. Manisha Samant for their invaluable co-operation and support without which this noble work would have not seemed the light of the day. I owe to many others who helped me directly or indirectly during my research work. Sincere thanks to all the faculty members for their guidance.

I would like to thankfully acknowledge the help and cooperation received from the Principal Mrs. Anuradha Kamad, Shailesh Singh and Boys (Students) of T.V.M High School, Kandivali.

Whole hearted thanks to my family Members viz. Mrs. Bharati Chintaman Meher (Mother), Mr. Chintaman Ganpat Meher (Father), Mr. Vivek Chintaman Meher (Brother) Manasi Kangutkar (Friend) especially who helped me in conducting the tests and training programme, and all my Master Degree Colleagues and well-wishers for their co-operation, constant encouragement and best wishers for the completion of the study.

**July, 2020 Priyanka Chintaman Meher**

(Research scholar)

**TABLE OF CONTENT**

|  |  |  |
| --- | --- | --- |
| **Sr.** | **Description** | **Page** |
|  | Certificate | i |
|  | Preface | ii |
|  | Acknowledgement | iii |
|  | Table of Contents | iv |
|  | List of Table | v |
|  | List of Appendices | vi |
| **CHAPTER** | **I. INTRODUCTION** | **1-5** |
| 1.1  1.2 | Conceptual Framework  Significance of the Study | 1  3 |
| 1.3 | Statement of the Problem | 3 |
| 1.4  1.5  1.6 | Operational Definitions of the Important Terms Used  Objectives of the Study  Hypothesis of the Study | 3  4  5 |
| 1.7 | Limitations of the Study | 5 |
| 1.8 | Delimitation of the Study | 5 |
| **CHAPTER** | **II. REVIEW OF RELATED LITERATURE** | 6- 13 |
|  | Review Related to Handball  Review Related to Health-Related Physical Fitness  Review Related to Achievement Motivation | 6  10 |
|  | Critical Evaluation of the Review |  |

|  |  |  |
| --- | --- | --- |
| **CHAPTER** | **III. METHODOLOGY** | **14- 22** |
| 3.1 | Design of the Study | 14 |
| 3.2 | Selection of Population and Sample | 14 |
| 3.3 | Selection of the Variable | 15 |
| 3.4  3.4.1  3.4.2  3.4.3 | Reliability of Data  Reliability of Test  Reliability of Tools  Testers Competency | 15  15  15  15 |
| 3.5  3.6 | Description of Tests  Description of Experimental Treatment | 16 |
| 3.7  3.8  3.9 | Training Schedules  Procedure of the Study  Statistical Procedure Used | 19  20  21 |
|  | **REFERENCES**  **APPENDICES** | **23-24**  **25-30** |

**LIST OF TABLE**

|  |  |  |
| --- | --- | --- |
| **TABLE** | **DESCRIPTION** | **PAGE** |

3.1 Training Schedule 20

3.2 Eight Weeks Training Program 21

**LIST OF APPENDIX**

|  |  |  |
| --- | --- | --- |
| **APPENDIX** | **DESCRIPTION** | **PAGE** |
|  |  |  |
| I | Questionnaire | 25-30 |
|  |  |  |

**CHAPTER I**

**INTRODUCTION**

Handball, a popular game throughout the world, was introduced in Germany by a gymnastics teacher, Max Heiser, in 1917. The game was primarily devised for girls and played 11-a-side on a football field. There are, however authentic reports of a similar game, “Handball” being played in Denmark as early as 1904.

In 1919, another Berlin sports teacher, Carl Schelenz, modified the existing rules. He advocated the use of a smaller ball, the players were allowed to fight for the ball, the three-step rule was introduced and the 16-metre penalty area of the football field provided an ideal provided an idea throwing zone. Soon other countries accepted these rules and handball was on its way to becoming an international sport.

In,1923, the first inter-city match between Berlin and Dresden took place, while the first international handball match was played between Germany and Austria on 13 September 1925.

During the Olympic Games of 1928 in Amsterdam,11 countries got together to found the International Handball Federation (IHF).Along with the increase in members, another innovation took place in the Scandinavian countries, where due to the climatic condition, handball was taken indoors. The rules were modified and adapted to indoor conditions and finally evolved to the format prevailing today.A great boost to the sport was provided when in 1972, handball was introduced as an Olympic discipline at Munich. The growing popularity of handball is not only due to the fact that it is a healthy competitive sport, but also due to the simple rules and seven simple equipment needed: a ball, two goals and a small playing field (not forgetting, of course, the seven players needed in a team).

The introduction of referees, unlimited, tactical moves, the quick switch from defence to attack have all contributed to the game enjoying universal popularity and it is now played in as many as 95 countries.

In India, the game was first played at Rohtak (Haryana) in 1972 and since then it has spread all over the country. It’s inclusion in the 1982 Asian Games at New Delhi was a major factor in helping to popularise the game in India.

The easiest way to describe team handball is as water polo solid ground with elements of basketball and soccer-foot speed, dribbling , passing , arms-up defenses and trying to hurl a ball past a goalie and into a net – are all parts of the game. But team handball’s blend of speed , grace, skill and raw, athletic power on offence could just as easily be a definition of hockey. In fact, it’s those qualities that make team handball’s proponents all the more baffled over its small following in india. After all, team handball has all the aggressiveness and fast-paced, up-and-down flow and wild action around the goal, not to mention rugged, fearless play, of classic fire wagon hockey.

“Team handball is a very physical sport,” says warren poncsak, a Regina- based coach of Canada’s men’s handball team at the 1999 pan American Games. “At the risk of our insurers hearing about this, at an adult level , it’s a controlled contact sports , where the defense tries to contain of absorb the offensive player’s momentum. But it’s a clean sport- the contact that is allowed is face-to-face. You can’t hit from behind or from the side.”

Handball is a popular, spectacular, dynamic and exciting sport that requires speed and athleticism, patience and fitness, strength and power, flamboyance and individual skills, stamina and fitness and, above all, teamwork. The game is played over 140 nations and by over 15 million participants around the world and it is a wonderful mixture of soccer, basketball and a few water polo tactics thrown in (that’ll get your imagination going).

After soccer, Handball is one of the most popular sports in Europe and Africa. In America it is becoming organized with national and Continental Championships and in Oceania it is on the cusp of taking off. The sport is sometimes known as Olympic Handball or Team Handball in North America to distinguish it from Court Handball, which is played on a squash court with rules similar to squash and played with gloved hand instead of squash requests.

Handball comes in a variety of guises from the now rarely played field (Outdoor) Handball which was played on soccer sized field with soccer-sized goals, to the now popular Olympic (indoor) Handball played on a 40 m x 20 m court to the now recently introduced Beach (Sand) Handball played on the sands of a beach on a 27 m x 12 m playing area, both of which have 3m x 2m goals. Both have soccer-type goals on either end protected by a goalkeeper and the idea is to score more goals than your opposing team by throwing the ball into the goal. You may punch, throw, or even head the ball to a teammate. Touching the ball with leg below the knee is not allowed. However, you are allowed to take 3 seconds to rid of the ball. Court players-except the goalkeeper-are not allowed in the goal area. Otherwise, the ball is turned over to the opponents .

Achievement motivation, is referred to as the need for achievement, is an important determinant of aspiration, effort, and persistence when an individual expects that his performance will be evaluated in relation to some standard of excellence. Such behavior is called achievement-oriented.

Motivation to achieve is instigated when an individual knows that he is responsible for the outcome of some venture, when he anticipates explicit knowledge of results that will define his success or failure, and when there is some degree of risk, i.e., some uncertainty about the outcome of his effort. The goal of achievement-oriented activity is to succeed, to perform well in relation to a standard of excellence or in comparison with other are competitors

**History**

**T**eam handball originated in the 1890s when a German gymnastics instructor, konrad Koch, developed the structure and rules of the game. The first International match was played in 1925 in Hall, Germany, between teams from Austria and Germany. The game was introduced in the 1936 Olympic Games in Berlin as the 11-player outdoor game. After World War ll (11939-1945) Team Handball become a popular recreation activity in many academic institutions in Western Europe. When it was reintroduced in 1972 Olympics in Munich, West Germany, for men played as the 7-player indoor game. Team handball world championships were first held in 1938 for men and in 1949 for women. In both men’s and women’s competitions, teams from Germany, the former Union of Soviet Socialist Republics (USSR), the former Yugoslavia, Romania, Hungary, Sweden, and France traditionally were the most successful, although South Korea won the women’s gold medal in 1988 and 1992 Olympics.

The first International competition for men and women was held in the year 1925 and 1930 in Vienna Austria respectively. In the beginning being running oriented game it came under the International Amature Athletic Federation (I.A.A.F.) and organized many minor sports in Europe at that time. In 1926 I.A.A.F. appointed a special committee representing the countries where Handball Was played to set up standard rules for this game. International Amateur Handball Federation is the ruling body throughout the world.

The ancestry of modern team handball can be traced back more than 3000 years to ancient Greece. In the Odyssey, Homer described a handball game called urania. Shortly after the time of Christ, the Roman physician Claudius Galenus described harpastons, and during the Middle Ages, a third ancestral handball game named fangball was recorded by Walter von der vogelweide. Each of these were played in an open field or courtyard, and were similar to team handball.

The modern game can be played outdoors on an open field very similar to that used for basketball. Net goals are located at each end of the court or field, and are constructed like smaller versions of soccer goals. A leather covered ball seven inches in diameter is the other piece of equipment. The basic elements of training a handball player must include gymnastic exercises, running, jumping, catching, ball handling skills, tactical awareness an probably the most important, a sense of fair play. In India, the game was first played at Rohtak (Haryana) in 1972 and since then it has spread all over the country. Its inclusion in the 1982 Asian Games at New Delhi was a major factor in helping to popularize the game in India.

**1.2 Significance of the study**

* The result obtained from this study will be helpful to know the effect of handball training.
* The study will spread awareness about importance of handball training to parents, teachers and students.
* The study will help to achieve optimum level of motivation to school students.
* The study will help to understand effect of handball training on health related physical fitness on school students.
* The result will be helpful for further development of health related physical fitness components.
  1. **Statement of the problem**

In this piece of research, the researcher intends to see the effect of handball training on health related physical fitness under the topic, “***Effectiveness of Handball Training On The Basis Of Health Related Physical Fitness and Achievement Motivation of School Students of Mumbai***”

* 1. **Operational definitions of the terms used**
* **Cardiovascular Endurance (Kansal D. K pg. no. 187)**

The ability to perform muscular work at submaximal level by moderate contractions for a long time is known as cardiovascular endurance.

* **Muscular Strength (Kansal D. K pg. no. 186)**

Maximal contraction power of the muscles is known as muscular strength.

* **Muscular Endurance (Kansal D. K pg. no. 187)**

The duration for which the muscle groups may perform work maximally is known as Muscular Endurance.

* **Flexibility (Kansal D. K pg. no. 187)**

The range of movement in a joint or sequence of joints is known as flexibility.

* **Body Composition (Kansal D. K pg. no. 187)**

Freedom from obesity is measured by finding body fat content (adipose tissue) with respect to one’s body weight.

**Achievement Motivation**

Achievement motivation may be defined as the energization and direction of competence-relevant behavior or why and how people strive toward competence (success) and away from incompetence (failure).

* 1. **Objectives of the study**

The following objectives are as under:

* To compare the adjusted mean scores of muscular strength of school students of handball training group and control group by taking pre muscular strength as covariate.
* To compare the adjusted mean scores of muscular endurance of school students of handball training group and control group by taking pre muscular endurance as covariate.
* To compare the adjusted mean scores of flexibility of school students of handball training group and control group by taking pre flexibility as covariate.
* To compare the adjusted mean scores of cardio-vascular endurance of school students of handball training group and control group by taking pre cardio-vascular endurance as covariate.
* To compare the adjusted mean scores of body composition of school students of handball training group and control group by taking pre body composition as covariate.
* To compare the adjusted mean scores of achievement motivation of school students of handball training group and control group by taking pre achievement motivation as covariate.

**1.6 Hypothesis of the study**

The hypothesis of the study is as under:

**H01:** There is no significant difference in adjusted mean scores of **Muscular Strength**  of school students where pre muscular strength is taken as covariate.

**H02**: There is no significant difference in adjusted mean scores of **Muscular Endurance** of school students where pre Muscular Endurance is taken as covariate.

**H03:** There is no significant difference in adjusted mean scores of **Flexibility** of school students where pre flexibility is taken as covariate.

**H04:** There is no significant difference in adjusted mean scores of **Cardio-vascular Endurance** of school students where pre Cardio-vascular Endurance is taken as covariate.

**H05:** There is no significant difference in adjusted mean scores of **Body Composition** of school students where pre body composition is taken as covariate.

**H06:** There is no significant difference in adjusted mean scores of **Achievement Motivation** of school students where pre achievement motivation is taken as covariate.

**1.7 Limitations of the study**

The following limitations are as under:

* It could not be possible to control subject’s day to day activities.
* There was no control in food habits.
* The school students selected for the study did not have background of sports.
* It could not be possible to control the climatic conditions.

**1.8 Delimitations of study**

The following delimitations of this study are as under:

* The study was delimited for 8 weeks of handball training program. (Except holidays and Sundays).
* The study was delimited to the school students aged 13-15years.
* The study was delimited to boys only.
* The study was delimited to handball training only.
* The study was delimited to selected health related physical fitness component.
* The study was delimited to T.V.M high school, Kandivali.

**CHAPTER II**

**REVIEW OF RELATED LITERATURE**

**2.1 Reviews Related to Handball Training**

**2.2 Reviews Related to Health Related Physical Fitness**

**2.3 Reviews Related to Psychological Variable (Achievement Motivation).**

**2.1 Reviews Related to Handball Training**

**Eva Ageberg, (2020)** Youth handball players are vulnerable to injuries. Because there is no available injury prevention training specifically developed for youth handball players targeting both upper and lower limbs or incorporating psychological aspects of injury, we undertook the ‘Implementing injury Prevention training Routines in Teams and Clubs in youth Team handball (I-PROTECT)’ project. We used an ecological participatory design incorporating the perspectives of multiple stakeholders (health beneficiaries, programme deliverers and policy makers). The aim of this paper was to describe the process of developing the I-PROTECT model, featuring injury prevention training and an accompanying implementation strategy. We used the generalisable six-step intervention development process, outlined to guide researchers when developing implementable, evidence-based sports injury prevention interventions, to develop the I-PROTECT model. The six-step process involves establishing a research–stakeholder collaborative partnership to (1) identify and synthesise research evidence and clinical experience; (2) consult with relevant experts; (3) engage end users to ensure their needs, capacity and values are considered; (4) test the feasibility and acceptability of the intervention; (5) evaluate the intervention against theory; and (6) obtain feedback from early implementers. Two community handball clubs in southern Sweden, offering organised training for youth male and female players, and the district handball federation, participate in the intervention development. Drafts of the I-PROTECT model will be developed and revised with key stakeholder advice and input throughout all six steps. The I-PROTECT model described will be an end user-driven intervention, including evidence-based, theory-informed and context-specific injury prevention training for youth handball, and an associated implementation strategy.  
  
 **Ireneusz Cichy, (2020)** The purpose of this study was to evaluate changes in the estimated body composition of elite female and male Polish handball players during a five-week preseason training camp. Height and weight were measured, while body composition was estimated with bioelectrical impedance in 18 male and 17 female handball players before and after the five-week training protocol. Components of body composition included total body water (TBW), fat-free mass (FFM), muscle mass (MM), and absolute and relative fat mass (FM). Weight and body mass index (BMI) did not change in males, but declined in females after five weeks of training. FM and %FM declined, while estimated TBW, FFM, and MM increased significantly after training in both males and females. In contrast, comparisons of log transformed ratios for changes in weight, the BMI and body composition in males and females, respectively, suggested that estimated TBW, FFM, and MM increased relatively more in females than in males, while FM and %FM decline relatively more in males than females. Overall, the five-week preseason training program modified the body composition of male and female handball players. FM and %FM decreased, while estimated TBW, FFM, and MM increased, in both males and females after the preseason training program. Comparisons of log transformed ratios for changes in body composition in males and females suggested sexual dimorphism in response to intensive preseason training.

**Jürgen Hänggi, (2015)** There is no doubt that good bimanual performance is very important for skilled handball playing. The control of the non-dominant hand is especially demanding since efficient catching and throwing needs both hands. We investigated training-induced structural neuroplasticity in professional handball players using several structural neuroimaging techniques and analytic approaches and also provide a review of the literature about sport-induced structural neuroplastic alterations. Structural brain adaptations were expected in regions relevant for motor and somatosensory processing such as the grey matter (GM) of the primary/secondary motor (MI/supplementary motor area, SMA) and somatosensory cortex (SI/SII), basal ganglia, thalamus, and cerebellum and in the white matter (WM) of the corticospinal tract (CST) and corpus callosum, stronger in brain regions controlling the non-dominant left hand. Increased GM volume in handball players compared with control subjects were found in the right MI/SI, bilateral SMA/cingulate motor area, and left intraparietal sulcus. Fractional anisotropy (FA) and axial diffusivity were increased within the right CST in handball players compared with control women. Age of handball training commencement correlated inversely with GM volume in the right and left MI/SI and years of handball training experience correlated inversely with radial diffusivity in the right CST. Subcortical structures tended to be larger in handball players. The anatomical measures of the brain regions associated with handball playing were positively correlated in handball players, but not interrelated in control women. Training-induced structural alterations were found in the somatosensory-motor network of handball players, more pronounced in the right hemisphere controlling the non-dominant left hand. Correlations between handball training-related measures and anatomical differences suggest neuroplastic adaptations rather than a genetic predisposition for a ball playing affinity. Investigations of neuroplasticity specifically in sportsmen might help to understand the neural mechanisms of expertise in general.  
  
 **Nenad Stojiljković, (2020)** The aim of this study was to examine the impact of team size on acute physiological, perceptual, and activity demands of recreational handball to provide a better understanding for the potential prescription of recreational handball to achieve health benefits. Active, male college students (N=22) completed 3-, 4-, and 5-a-side handball game formats across three separate sessions following a repeated-measures, crossover design. Heart rate (HR), blood lactate concentration (BLa), rating of perceived exertion (RPE), distance covered, and frequency of accelerations/decelerations were monitored during games. Each game format elicited vigorous intensities with a mean HR in the range 82–85%HRmax and post-game BLa in the range 3.9–4.4 mmol·L-1. No significant differences (P>0.05) in absolute (ηp2=0.40), relative mean HR (ηp2=0.43), BLa (ηp2=0.16), total distance (ηp2=0.32), total accelerations (ηp2=0.23), or total decelerations (ηp2=0.23) were observed between game formats. A significant effect was observed for RPE (ηp2=0.51), where 3-a-side games elicited a higher RPE than 5-a-side games (P=0.03, large). Modifying player number has a negligible effect on the physiological and activity demands encountered during recreational handball games. Recreational handball consisting of 3–5 players imposes similar intermittent workloads, resulting in vigorous physiological responses concomitant with those recommended for overall health improvements as part of regular training.

**Nicola Luigi Bragazzi, (2020)** Purpose: Handball (Team Handball) is an intermittent and strenuous contact sport, the successful performance of which depends on frequent body contacts, and the ability to make repeated explosive muscular contractions required for jumping, acceleration, sprinting, turning, changing pace, and throwing a ball. Many studies have investigated the effect of resistance training (RT) in handball players, however with conflicting results. Therefore, our objective was to investigate the impact of RT on maximal strength (isometric and isokinetic strength), the power of both lower and upper limbs, and throwing velocity, in handball players. Methods: A comprehensive literature search yielded a pool of 18 studies, which were retained in the systematic review and meta-analysis. Results: A total of 275 handball players were included. The overall effect size (ES) of RT was 0.996 ([95%CI 0.827–1.165], p = 0.0000). At the multivariate meta-regression, the effect of publication year was significant, as well as the effects of country, gender, and level. The impact of RT on isokinetic strength was not significant (ES 0.079 [95%CI −0.060–0.219], p = 0.265), whereas the impact of RT on throwing (ES 1.360 [95%CI 0.992–1.728], p = 0.000) was significant, as well as the effects of RT on isometric strength (ES 0.398 [95%CI 0.096–0.700], p = 0.010), on maximal strength (ES 1.824 [95%CI 1.305–2.343], p = 0.000), and on power (ES 0.892 [95%CI 0.656–1.128], p = 0.000). Conclusions: RT has a significant impact in handball players. Handball coaches could design conditioning protocols and programs based on our results. However, due to a number of shortcomings, including the high, statistically significant heterogeneity among studies and the evidence of publication bias, further high-quality investigations are needed.

**Souhail Hermassi, (2019)** The purpose of this study was to assess the effect of short-term resistance training and two weeks of tapering on physical performances in handball players. Following a ten-week progressive resistance training program, subjects were divided between an experimental (n = 10) and a control group (n = 10). The experimental group completed a resistance training program, followed by a two-week period when the training intensity was tapered by 60%, while the control group maintained their typical pattern of training. Muscle power (force–velocity test and squat and counter-movement jump tests), sprinting ability (10m and 30m), ability to change direction (T-half test) and throwing velocity (a 3-step throw with a run, and a jump throw) were evaluated before training, at the end of training and after tapering. The experimental group showed significantly larger interaction effects for the 10-week training period (12/15, 80%), than for the following 2 weeks of tapering (10/15, 67%), with the largest gains being in 15 m sprint times (d = 3.78) and maximal muscular strength in the snatch (d = 3.48). Although the performance of the experimental group generally continued to increase over tapering, the mean effect size for the training period was markedly higher (d = 1.92, range: 0.95–3.78) than that seen during tapering (d = 1.02, range: -0.17–2.09). Nevertheless the ten weeks of progressive resistance training followed by two weeks of tapering was an effective overall tactic to increase muscle power, sprint performance and ball throwing velocity in handball players.

**Susana C. A. Póvoas, (2017)** Lack of motivation to exercise was reported as a major cause of sedentary behavior in adulthood. This descriptive study had examines the acute physical and physiological demands of recreational team handball and evaluates whether it could be suggested as an exercise mode for fitness and health enhancement in 33–55-year-old untrained men. Time-motion, heart rate (HR), and blood lactate analyses were obtained from 4 recreational matches. Mean distance covered during the 60 min matches was 6012 ± 428 m. The players changed match activity 386 ± 70 times, of which high-intensity runs and unorthodox movements amounted to 59 ± 18 and 26 ± 26 per match, respectively. The most frequent highly demanding playing actions were jumps and throws. Match average and peak HR were 82 ± 6% and 93 ± 5%  HR max, respectively. Players exercised at intensities between 81 and 90%  HR max for 47% (28 ± 14 min) and >90%  HRmax for 24% (14 ± 15 min) of total match time. Match average and peak blood lactate values were 3.6 ± 1.3 and 4.2 ± 1.2 mM, respectively. Recreational team handball is an intermittent high-intensity exercise mode with physical and physiological demands in the range of those found to have a positive effect on aerobic, anaerobic, and musculoskeletal fitness in adult individuals. Training studies considering recreational team handball as a health enhancing intervention are warranted.

**Vidar Andersen, (2018)** The aim of the study was to examine the effects of full-body elastic resistance band training in young female team handball players. 12 players (16.5±0.7 years, 166±5.0 cm, 65.9±8.8 kg) completed an 11-week control period followed by a 9-week elastic resistance band training period. The training program, consisting of 6 exercises, was incorporated into the teams’ regular handball training sessions 3 times per week. Each exercise was performed with 3 sets of 6–10 explosive repetitions (5–9 on the Borg CR10 Scale®). The maximal power output in squat and bench press, jump height, throwing velocity and repeated agility run was tested before and after the control and training periods. The elastic resistance band period had greater improvement vs. the control period for countermovement jump with or without arm swing (10% vs. –6 to –2%) and power output at lighter loads (10 to 12% vs. –6 to 0%). For the 3 throwing velocity tests, there were tendencies towards increased velocity in the elastic resistance band period compared to the control period ( p =0.07–0.10). For the repeated agility run, there was a reduction in the mean and fastest time compared to the training period (2 to 3% vs. –1 to 1%). In conclusion, a brief, elastic resistance band training program, incorporated into the regular handball training sessions, improved explosive lower-limb performance in young female handball players more than handball training alone

**2.2 Reviews Related to Health-Related Physical Fitness**

**Amri Hammami, (2018)** The aims of the study was to (1) investigate the health-related physical fitness profile of untrained adolescent boys in comparison to adolescent soccer players, (2) determine the intensity and enjoyment of 6 v 6 and 4 v 4 small-sided games, and (3) evaluate the health-related effects of a short-period of soccer training in the untrained group. Forty-one adolescent boys (untrained, n = 24: age = 15.9 ± 0.6 years; trained, n = 17: age = 15.7 ± 0.7 years) were recruited. For Purpose 1, the players (n = 17) and the untrained (n = 24) boys were tested for speed, jumping power, postural balance, flexibility, and aerobic capacity. After baseline testing, Purposes 2 and 3 were addressed by randomly assigning the untrained boys to either a soccer-training group (small-sided games, 2 sessions per week for 8 weeks) or to a control group, followed by identical retesting. At baseline, physical fitness was higher (p < 0.001) in trained players than in untrained for aerobic fitness, sprinting, jumping power, and postural balance. Small-sided games using 6 v 6 or 4 v 4 elicited similar heart rate (HR) (mean:  ~ 85% peak heart rate, Hreik), rate of perceived exertion, and enjoyment responses. Over 8 weeks, the between-group analysis revealed that soccer training had a large beneficial effect on postural balance (45%) when compared with control group with unclear effects on other fitness parameters. Adolescent soccer players had markedly higher physical fitness compared with untrained adolescents. Small-sided soccer games practiced by untrained adolescents elicited high exercise intensity. While 8 weeks of twice-weekly soccer training sessions induced significant improvement in postural balance, the short duration of the study was not sufficient to result in between-group differences in sprint and jump performance or aerobic fitness.

**Augusto César Ferreira De Moraes, (2019)** The assessment of physical fitness has become a necessary issue in epidemiological studies, since a reduction in fitness is directly associated with early mortality. Therefore, the development of simple, accurate, and inexpensive methods is necessary to measure physical fitness. This study aimed to determine the reliability and validity of the criteria and constructs of the International Fitness Scale (IFIS), Portuguese version, in Brazilian pediatric populations. A total of 190 children aged 3–10 years and 110 adolescents aged 11–17 years were enrolled in an observational study of reliability and validity. For reliability, the participants completed a questionnaire twice (with an interval of 15 days). To test the criterion validity, we analyzed the agreement between the questionnaire and physical tests (20-m shuttle run test, handgrip strength, standing long jump tests, 4 × 10-m shuttle run test, and back-saver sit and reach test), and the construct validity was estimated by agreement between the questionnaire and high blood pressure. The reliability was analyzed by kappa coefficients. The agreement between the testing and retesting of the questionnaire was evaluated by kappa coefficients. We applied a 2 × 2 table to estimate the specificity, sensitivity, and accuracy of the questionnaire. The mean age of the children was 6.7 years (n = 190), and for the adolescents it was 14.6 years (n = 110). The questionnaire reliability showed an almost perfect score (κ ≥ 0.93 in children and κ ≥ 0.88 in adolescents). The questionnaire showed moderate criterion validity (κ ≥ 0.40 in children and adolescents) as well as moderate construct validity (κ ≥ 0.40) in the components of general conditioning, cardiorespiratory capacity, muscular strength, and speed/agility in children and in the components of cardiorespiratory capacity, muscle strength, and speed/agility in adolescents. The questionnaire was a sensitive method for measuring physical fitness. The Portuguese version of the IFIS is a reliable and valid method for measuring physical fitness in pediatric populations.

**Michael D. Garber, (2014)** In addition to excess adiposity, low cardiorespiratory fitness (CRF) and low musculoskeletal fitness (MSF) are important independent risk factors for future cardio-metabolic disease in adolescents, yet global fitness surveillance in adolescents is poor. The objective of this study was to describe and investigate geographical variation in levels of health-related physical fitness, including CRF, MSF, body mass index (BMI), and waist circumference (WC) in Chilean 8th graders. This cross-sectional study was based on a population-based, representative sample of 19,929 8th graders (median age = 14 years) in the 2011 National Physical Education Survey from Chile. CRF was assessed with the 20-meter shuttle run test, MSF with standing broad jump, and body composition with BMI and WC. Data were classified according to health-related standards. Prevalence of levels of health-related physical fitness was mapped for each of the four variables, and geographical variation was explored at the country level by region and in the Santiago Metropolitan Area by municipality. Girls had significantly higher prevalence of unhealthy CRF, MSF, and BMI than boys (p<0.05). Overall, 26% of boys and 55% of girls had unhealthy CRF, 29% of boys and 35% of girls had unhealthy MSF, 29% of boys and 44% of girls had unhealthy BMI, and 31% of adolescents had unhealthy WC. High prevalence of unhealthy fitness levels concentrates in the northern and middle regions of the country and in the North and Southwest sectors for the Santiago Metropolitan Area. Prevalence of unhealthy CRF, MSF, and BMI is relatively high among Chilean 8th graders, especially in girls, when compared with global estimates. Identification of geographical regions and municipalities with high prevalence of unhealthy physical fitness presents opportunity for targeted intervention.

**Rodrigo Ramirez-Campillo, (2018)** Plyometric jump training (PJT) is a frequently used and effective means to improve amateur and elite soccer players' physical fitness. However, it is unresolved how different PJT frequencies per week with equal overall training volume may affect training-induced adaptations. Therefore, the aim of this study was to compare the effects of an in-season 8 week PJT with one session vs. two sessions per week and equal training volume on components of physical fitness in amateur female soccer players. A single-blind randomized controlled trial was conducted. Participants (N = 23; age, 21.4 ± 3.2 years) were randomly assigned to a one session PJT per-week (PJT-1, n = 8), two sessions PJT per-week (PJT-2, n = 8) or an active control group (CON, n = 7). Before and after training, participants performed countermovement jumps (CMJ), drop-jumps from a 20-cm drop-height (DJ20), a maximal kicking velocity test (MKV), the 15-m linear sprint-time test, the Meylan test for the assessment of change of direction ability (CoDA), and the Yo-Yo intermittent recovery endurance test (Yo-YoIR1). Results revealed significant main effects of time for the CMJ, DJ20, MKV, 15-m sprint, CoDA, and the Yo-YoIR1 (all p < 0.001; d = 0.57–0.83). Significant group × time interactions were observed for the CMJ, DJ20, MKV, 15-m sprint, CoDA, and the Yo-YoIR1 (all p < 0.05; d = 0.36–0.51). Post-hoc analyses showed similar improvements for PJT-1 and PJT-2 groups in CMJ (Δ10.6%, d = 0.37; and Δ10.1%, d = 0.51, respectively), DJ20 (Δ12.9%, d = 0.47; and Δ13.1%, d = 0.54, respectively), MKV (Δ8.6%, d = 0.52; and Δ9.1%, d = 0.47, respectively), 15-m sprint (Δ8.3%, d = 2.25; and Δ9.5%, d = 2.67, respectively), CoDA (Δ7.5%, d = 1.68; and Δ7.4%, d = 1.16, respectively), and YoYoIR1 (Δ10.3%, d = 0.22; and Δ9.9%, d = 0.26, respectively). No significant pre-post changes were found for CON (all p > 0.05; Δ0.5–4.2%, d = 0.03–0.2). In conclusion, higher PJT exposure in terms of session frequency has no extra effects on female soccer players' physical fitness development when jump volume is equated during a short-term (i.e., 8 weeks) training program. From this, it follows that one PJT session per week combined with regular soccer-specific training appears to be sufficient to induce physical fitness improvements in amateur female soccer players

**Weiyun Chen, (2018)** This study examined associations between students’ physical fitness and physical activity (PA), as well as what specific physical fitness components were more significant correlates to being physically active in different settings for boys and girls. A total of 265 fifth-grade students with an average age of 11 voluntarily participated in this study. The students’ physical fitness was assessed using four Fitness Gram tests, including Progressive Aerobic Cardiovascular Endurance Run (PACER), curl-up, push-up, and trunk lift tests. The students’ daily PA was assessed in various settings using a daily PA log for 7 days. Data was analysed with descriptive statistics, univariate analyses, and multiple R-squared liner regression methods. Performance on the four physical fitness tests was significantly associated with the PA minutes spent in physical education (PE) class and recess for the total sample and for girls, but not for boys. Performance on the four fitness tests was significantly linked to participation in sports/dances outside school and the total weekly PA minutes for the total sample, boys, and girls. Further, boys and girls who were the most physically fit spent significantly more time engaging in sports/dances and had greater total weekly PA than boys and girls who were not physically fit. In addition, the physically fit girls were more physically active in recess than girls who were not physically fit. Overall, students’ performance on the four physical fitness tests was significantly associated with them being physically active during PE and in recess and engaging in sports/dances, as well as with their total weekly PA minutes, but not with their participation in non-organized physical play outside school.

**Zheng Zhu, (2017)** This study was to present the 2016 prevalence estimates of Chinese school-aged children meeting physical fitness standards and to examine differences by sex and residence locales in children who did not meet fitness standards. We conducted cross-sectional analyses of 171,991 children and adolescents (boy: 50.0%, Grades 1–12) who participated in the 2016 Physical Activity and Fitness in China—The Youth Study. The main outcomes were fitness measures, assessed by the 2014 revised Chinese National Student Physical Fitness Standard (CNSPFS), covering areas of aerobic capacity, upper body strength, flexibility, body mass index, abdominal strength, and trunk strength. Children's overall physical fitness performance was categorized, per CNSPFS standards, as excellent, good, pass, or no pass. Data on the prevalence of physical fitness categories and not meeting fitness standards (i.e., among children who received a “no pass” mark) were analyzed, through logistic regression, by sex (boy, girl) and residence locales (urban, rural) across 3 school grades (primary, junior middle, and junior high). In 2016, 5.95% of Chinese children and adolescents achieved an “excellent” mark, 25.80% received a “good” rating, 59.90% received a “pass”, and 8.35% received a “no pass”. Overall, boys were more likely to not pass the fitness standards compared with girls (adjusted odds ratio (aOR) = 1.710; 95% confidence interval (CI): 1.708–1.712) and children living in urban areas were more likely to not pass the standards than those living in rural areas (aOR = 1.298; 95%CI: 1.296–1.299). Consistent patterns of not meeting fitness standards were also found by sex and residence locales across all 3 school grades. In the Chinese school-aged population, about 3 in 10 children achieved an “excellent” or “good” fitness standard in 2016, and about 8% of this population did not meet CNSPFS standards. Children living in urban areas were more likely to not meet minimum fitness performance levels, and boys in school were more likely to not meet minimum fitness performance levels than girls.

**Zhixiong Zhou, (2019)** Background: School physical activity (PA) policy, physical education curriculum, teacher training, knowledge of physical fitness, and parental support are among the key issues underlying the declining trend of physical fitness in children and adolescents. The Chinese CHAMPS was a multi-faceted intervention program to maximize the opportunities for moderate and vigorous physical activity (MVPA), and increase physical fitness in middle school students. The purpose of the study was to test whether the levels of modification in school physical education policy and curriculum incrementally influenced the changes in cardiorespiratory fitness and other physical fitness outcomes. Methods: This 8-month study was a clustered randomized controlled trial using a 2 × 2 factorial design. The participants were 680 7th grade students (mean age = 12.66 years) enrolled in 12 middle schools that were randomly assigned to one of four treatment conditions: school physical education intervention (SPE), afterschool program intervention (ASP), SPE+ASP, and control. Targeted behaviors of the Chinese CHAMPS were the student’s sedentary behavior and MVPA. The study outcomes were assessed by a test battery of physical fitness at the baseline and posttest. Sedentary behavior and MVPA were measured in randomly selected students using observations and accelerometry. Results: The terms contrasting the pooled effect of SPE, ASP, and SPE+ASP vs. Control, the pooled effect of SPE and SPE+ASP vs. ASP only, and the effect of SPE+ASP vs. ASP on CRF and other physical fitness outcomes were all significant after adjusting for covariates, supporting the study hypothesis. Process evaluation demonstrated high fidelity of the intervention in the targeted students’ behaviors. Conclusions: Chinese CHAMPS demonstrated the impact of varying the amount of MVPA and vigorous physical activity (VPA) on the physical fitness in middle school students in support of the need to increase the opportunity for PA in schools and to introduce high-intensity exercises in school-based PA programs. Modification of school policy, quality of physical education curriculum, and teacher training were important moderators of the improvement in physical fitness. (Trial registration: ChiCTR-IOR-14005388, the Childhood Health; Activity and Motor Performance Study).

**Zoran Milanović, (2015)** The purpose of this study was to determine the effects of recreational soccer (SOC) compared to moderate-intensity continuous running (RUN) on all health-related physical fitness components in healthy untrained men. Sixty-nine participants were recruited and randomly assigned to one of three groups, of which sixty-four completed the study: a soccer training group (SOC; n = 20, 34±4 (means±SD) years, 78.1±8.3 kg, 179±4 cm); a running group (RUN; n = 21, 32±4 years, 78.0±5.5 kg, 179±7 cm); or a passive control group (CON; n = 23, 30±3 years, 76.6±12.0 kg, 178±8 cm). The training intervention lasted 12 weeks and consisted of three 60-min sessions per week. All participants were tested for each of the following physical fitness components: maximal aerobic power, minute ventilation, maximal heart rate, squat jump (SJ), countermovement jump with arm swing (CMJ), sit-and-reach flexibility, and body composition. Over the 12 weeks, VO2max relative to body weight increased more (p<0.05) in SOC (24.2%, ES = 1.20) and RUN (21.5%, ES = 1.17) than in CON (-5.0%, ES = -0.24), partly due to large changes in body mass (-5.9, -5.7 and +2.6 kg, p<0.05 for SOC, RUN and CON, respectively). Over the 12 weeks, SJ and CMJ performance increased more (p<0.05) in SOC (14.8 and 12.1%, ES = 1.08 and 0.81) than in RUN (3.3 and 3.0%, ES = 0.23 and 0.19) and CON (0.3 and 0.2%), while flexibility also increased more (p<0.05) in SOC (94%, ES = 0.97) than in RUN and CON (0–2%). In conclusion, untrained men displayed marked improvements in maximal aerobic power after 12 weeks of soccer training and moderate-intensity running, partly due to large decreases in body mass. Additionally, soccer training induced pronounced positive effects on jump performance and flexibility, making soccer an effective broad-spectrum fitness training intervention.

**2.3 Reviews Related to Psychological Variable (Achievement Motivation)**

**Boris Milavic, (2019)** Researchers in sport often try to investigate relations between athletes’ psychological skills and their sports results to predict top athletic achievements or unexpectedly poor performances. The Psychology Skills Inventory for Sports (Youth version), PSIS-Y, was developed to measure psychological characteristics of young athletes–differentiating well more talented and less talented young athletes. Nevertheless, previous studies revealed its inadequate, factorial validity. Thus, the aim of this study was to develop and investigate the psychometric proprieties of a brief version of the PSIS-Y (PSIS-Y-SF) in a sample of young Croatian athletes. Participants (n = 304; 188 females and 116 male) were recruited in clubs/teams all over Croatia and all of them competed in the Croatian Championship in youth (n = 157) and junior category (n = 147). The PSIS-Y-SF was derived by ten expert psychologists with five of them who had past experiences of agonistic sport practice. Psychometric analysis included Confirmatory Factor Analysis (CFA), internal consistency analysis (Raykov’s Maximal Reliability), and correlation between subscales. Moreover, Multivariate Analyses of Variance (MANOVA) was run to test statistical differences between the players’ categories (male youth vs. male junior vs. female youth vs. female junior) in all of the subscales. Results of the CFA suggested the adequateness of the supposed six first-order factor solution for the PSIS-Y-SF. The Maximal Reliability statistics suggest a good internal consistency for all of the subscales and the MANOVA suggested differences between the player’s categories. The PSIS-Y-SF resulted to be a valid and reliable tool for the assessment of sports psychological skills. Findings from the psychometric evaluation of PSIS-Y-SF suggest that this is a useful tool, which may further assist in the measurement and conceptualization of sport psychological skills.

**Claudia Zuber, (2020)** The coach-rating scale for Achievement-Motivated Behavior in Individual Sports (AMBIS-I) was constructed to measure achievement motivation, not from athletes’ own views but from coaches’ perspectives. The tool was already checked for reliability as well as content, factorial, and concurrent criterion validity (Zuber and Conzelmann, 2019). To further establish construct and criterion validity, two different samples were involved. Sample 1 included 67 experienced coaches rating their 278 athletes on the three AMBIS-I dimensions proactivity, ambition and commitment. In sample 2, 157 athletes completed self-report questionnaires measuring motivational and volitional concepts. Congruent and discriminant construct validity were assessed using the QCV-procedure (Westen and Rosenthal, 2003) by comparing experts’ predicted and empirically observed correlations between the coaches’ ratings on the AMBIS-I with the self-ratings of validated instruments. Consistent with theoretical expectations, achievement goal orientations, self-determination and self-optimization show significant positive relationships to the AMBIS-I scales, the negatively formulated volitional concepts, negative ones. As indicated by the 0.87 ≤ ralerting-CV ≤ 0.95, the general patterns of the expert’s predictions triangulate consistently with the observed correlations. The findings concerning absolute agreement were mixed. Even though the ICCs suggest sufficient to good consistency, the values of rcontrast-CV are considerably lower. To indicate criterion validity, AMBIS-I display medium to large correlations with the actual performance level estimated by the coaches and small to medium correlations with the assigned potential for subsequent success one year later. In summary, we found solid indications, that AMBIS-I is a valid measure of achievement-motivated behavior in individual sports from coaches’ perspective.

**Mili, (2016)** The purpose of the study was to see the difference in sports achievement motivation between the medal winning players and non-medal winning players in the inter college sports tournament. 72 female athletes who won medal and 72 female athletes who did not win any medals in the tournament were identified and took part as subjects with an age ranging from 22.3 ± 3.4 in the study. Sports Achievement motivation was assessed using the SAM questionnaire, developed by M. L. Kamlesh (1990). To find out the difference in sports achievement motivation between female athletes who won medal and the female athletes who could not win any medals in various tournaments, the t test was applied at 0.05 level of significance. The result showed significant difference in the level of sports achievement motivation between both the group of successful and unsuccessful athletes. It was concluded that the athletes winning medal were higher than non-medal winning athletes in the sports achievement motivation.

**Dhapola, (2014)** The purpose of the study was to compare sports achievement motivation before and after competition among different games. Method For the purpose of study the subjects were four team games (Volleyball, Football, Basketball and Hockey) university players of Guru Ghasidas Vishwavidyalaya Bilaspur. The subjects were selected randomly from the team of students attending the regular university camp at GGU ground, Bilaspur. The researcher had been selected sports achievement motivation as a variable. The data was collected before and after competition of central zone tournament 2013. The participants were tested on two scales M. L. Kamlesh sports achievement motivation questionnaire. The data was analyzed by applying ANNOVA Technique followed by scheffe. The level of significance was set at 0.05. Result The findings of the present study have strongly indicates that players were highly motivated before the competition. Hence the hypothesis earlier set that there were significance difference in achievement motivation within different team games in light of the same the hypothesis is accepted. Conclusion: Significant difference was found in football, hockey, volleyball, basketball. The result also concludes that football and hockey team players are found highly motivated in comparison to basketball and volleyball players.

**Phairembam Jiteshw, (2013)** Several factors influence the selection of the specific sports participation of the current study. First the researcher’s familiarity with basketball through participation experience, specially with regard to motivation, initially spurred interest in the examination of motivational difference among male and female basketball players. Like physical fitness, the psychologist status of male and female basketball players is different. However, such a comparative study of sex-wise difference on sports achievement motivation in basketball is measure. Thus the purpose of the present study was to compare the Sports Achievement Motivation between Male and Female School Basketball Players of Pune City. SAMT consist of 20 Multiple Choice Questions of 40 marks. Each Question carries two (2) marks for correct answer and zero (0) mark for wrong answer. The question measured the extent to which student were motivated towards sports achievement. Considering the population of the study, stratified random sampling technique has been employed and the sample size has been targeted in this investigation to 40 male and 40 female basketball players (age group: 14- 17 years) who participated in the inter school level tournament. Statistical tool was used for accurate and systematic results. Independent t-test was use as Statistical Technique for comparative analysis. And the level of significant was set at 0.05 level. The result indicated that there is no difference on achievement motivation between male and female school basketball players of Pune city. Achievement Motivation between male and female inter-school basketball players of Pune city is found same.

**P.T, (2013)** Achievement motivation is the desire to excel at tasks. This means that individuals with high achievement motivation tend to set goals that are neither too easy nor extremely difficult. Easy tasks do not present a challenge and are of no interest. Extremely difficult goals increase the risk of failure. A person with high achievement motivation gains great satisfaction from completing a challenging goal. This reward is more important than praise, recognition or monetary compensation. A major characteristic of high achievement motivation is a stronger-than-average need for feedback on performance versus feedback on characteristics. Feedback on performance allows for measurement of success. The purpose of the study is to find out the level of achievement motivation among Athletes and Hockey players. The sample for the study consists of 50athletes and 50 Hockey players are the Participants in the Kerala University Inter Collegiate Tournaments during the year 2011-2012. The age of the subjects was between 19 and 26 years. The standard psychology tool device by Kamlesh (1990) was used to measure achievement motivation. This test consist of 20 questions includes both positive and negative statement. It was found the Athletes are having more Achievement Motivation than Hockey players because the Athletes required compulsory Motivation to achieve excel in sports then the Team Game Player is a group effort. This type is study is useful to the Physical Educators, Coaches and Sports psychologists to enhance the performance through achievement motivation.

**Sarangi, (2015**) Achievement Motivation is a consistent striving force of an individual to achieve success to certain standard of excellence in competing situation. In this study an attempt was made to study the effect of achievement motivation on the academic achievement of the high school students of tribal and non tribal communities in relation to their sex and locale. For this purpose a sample of 200 students, studying in class IX of ten government high schools of Goalpara District of Assam was selected. They were administered the measures of Achievement Motivation Scale by Gopal Rao. ‘t’ test and co-efficient of correlation (r) was applied to study the significance of difference between means and significant relation between achievement motivation academic achievement respectively. It was found that there was no significant difference between tribal- non tribal and boy - girl students but urban students have shown high achievement motivation than the rural students. In case of relationship between achievement motivation and academic achievement it was observed that there was no significant relation between achievement motivation and academic achievement of tribal, boy and rural students but there was a significant relationship between the achievement motivation and academic achievement of non-tribal, girl and urban students.

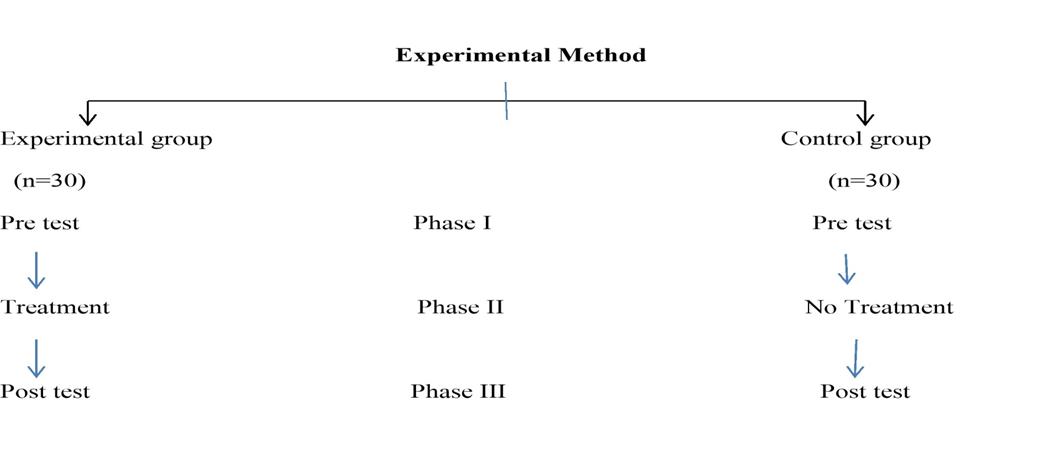
**Sultana, (2014)** A sense of achievement motivation runs individual to the right direction of career goal through flourishing the best effort. Any organization can have greater success if it nurtures such spirit. This study focuses on the factors affecting individual spirit of accomplishment across the industries, factors that work behind as individual's drive to a certain direction. It is being hypothesized here that factors affecting achievement motivations of individuals across the industries would not vary. A structured questionnaire has been designed to collect primary data. An examination of J.W. Atkinson's developed formula for achievement motivation entails three factors; namely, motive of individual, probability of success of a given task and the incentives or reward given for that task. After collection of data from the selected industries, the formula has been applied to measure the extent of difference among the factors as well as their variation across the industries. The collected data deny the study hypotheses and reveal that telecom and banking industries are lagging behind ready-made garments industry in terms of overall achievement motivation.

**CHAPTER III**

**METHODOLOGY**

**3.1 Design of the study**

This experimental design consisted of an experimental group which was compared with a control group for testing the effects of handball game on Health-Related Physical Fitness of boys aged 13 to 15 years. This experimental design was parallel group design. The experimental group received the Handball game training for 8 weeks, whereas the control group did not receive any such training. The result was compared of both the groups after a period of 8 weeks.



**3.2 SELECTION OF POPULATION AND SAMPLE**

* A Sample of sixty (n=60) boys’ students will be selected from T.V.M. high school, kandivali. Further they will be divided into group.

|  |  |
| --- | --- |
| GROUP | NO.OF STUDENTS |
| Experimental group | 30 |
| Control group | 30 |
| Total | 60 |

**3. 3 SELECTION FOR VARIABLES**

**Dependent Variables**

* **HEALTH RELATED PHYSICAL FITNESS COMPONENTS**
* Muscular Strength
* Muscular Endurance
* Flexibility
* Cardio-Vascular endurance
* Body Compotation
* **PHYCHOLOGICAL VARIABLES**
* Achievement Motivation

**Independent Variables**

The following independent variables are as under:

**Dribbling a.** Control dribble (CD) **b.** Speed dribble (SD)

c. Zigzag dribble (ZD)

**Catching**  a. Jump and catch (J&C) b. Run and catch (R&C)

**Passing a.** Shoulder pass (PS) b. Push pass (PP)

**Shooting a.** Jump shot (JS) b. Side shot (SS)

c. Penalty shot (PS)

**3.4. Reliability of Data**

**3.4.1**  **Reliability of Test**

Standardized tests available in Test and measurement in sports and Physical education by Kansal (2008) were taken by the research scholar. The tests were conducted on a group of 30 students. The same tests will be repeated after the training.

**3.4.2 Reliability of Tools**

Standard and reliable tools such as stopwatches, measuring taps, Nelson hand reaction measuring scale were utilized by the research scholar for the study.

**3.4.3 Tester’s Competency**

The research scholar is knowledgeable and capable of using the tools and applying them to the tests. The testing personnel assisting the study are equally capable.

**3.5 DESCRIPTION OF TEST: (Dependent variables)**

* **Health Related Physical Fitness**

**3.5.1 Muscular strength: -** **Push -Ups Test**

**Purpose**: - To Measure Muscular Strength.

**Equipment’s:** - marked area and stopwatch.

**Procedure:** -Begin in a push-up position on hands and toes with hands shoulder-width apart and elbows fully extended. While keeping a straight line from the toes to hips, and to the shoulders, lower your upper body so your elbows bend to 90 degrees. Push back up to the start position. That is one rep. Continue with this form and complete as many repetitions as possible without breaking form. Record the total number of full push-ups completed in one minute.

**Score**: - Number of reps in one minute.

**3.5.2 Muscular Endurance: - (Bent Knee Sit Ups)**

**Purpose:** - To Measure Muscular Endurance.

**Equipment’s**: - A stopwatch and a mat or dry turf or clean floor.

**Procedure: -** The subject is asked to lie on back with knees bent, feet on the floor with heels not more than 12 inches from the buttocks. The angle of the knees should be less than 90°. Subje The ct is asked to put his or her hand on the back of the neck with fingers clasped and to place the elbows squarely on the mat or turf or floor. The subject's feet are held by a companion to ascertain that the feet do not leave the surface and remain touching it. Then the subject is asked to tighten the abdominal muscles and to bring the head and elbows forward so as to curl up to touch the elbows to the knees. The entire above process constitutes one sit-up. The subject is asked to return to starting position with his/her elbows on the surface before sitting up again. The tester gives the above demonstration to all the subjects to be tested before the actual performance of the test. The timer gives the starting signals ready, go! At the word 'go' the timer starts the stopwatch and the subject starts the sit-up performance as quickly as possible with his/ her best efforts. The tester starts counting the number of sit-ups performed. After 60 seconds, the timer gives the signal stop and the subject stops, while the tester records the number of correctly executed sit-ups performed by the subject in 60 seconds. This gives the score of the test.

**Score:** Number of reps in one minute.

**3.5.3 Cardio–Vascular Endurance: (9 Minute Run-Walk Test) (Dr. D.K. Kansal 1996)**

**Purpose: -** To Measure Cardio-vascular Endurance.

**Equipment’s:** - Track or marked area and stopwatch

**Procedure: -**. At the signal ready Go! The subject covers the as much distance as possible in 9 minutes, Place markers at set intervals around the track to aid in measuring the completed distance. The tester counts the number of laps completed and additional incomplete lap distance covered in 9 minutes. Walking is allowed, though you should try and push yourself as hard as you can.

**Score**: -Cover distance in 9 minutes was count in meter.

**Instruction**: - Subjects can take standing start while running walking is also permitted but the performer has to cover the distance in 9 minutes.

**3.5.4 Flexibility: - (Sit and Reach Test )**

**Purpose**:-To measure the flexibility of the back and leg (hamstring) muscles.

**Equipment: -** A testing box or a flex measure and a yardstick.

**Procedure: -** The subject is asked to remove shoes and place his feet against the testing box while sitting on the floor with straight knees. Now the subject is asked to place one hand on top of the other so that the middle fingers of both hands are together at the same length. The tester keeps his hand on the knees of the subject to keep them straight not allowing any bending of the knees. The subject is asked to slide his hands along the measuring scale as far as possible without bouncing and to hold the farthest position for at least one second.

**Score: -** Each subject is given three trials and the highest score nearest to an inch is recorded and 10 inches are subtracted from the recorded reading to obtain the flexibility score.

**Instruction: -** The subject is instructed to lean forwards and place his hands over the measuring scale lying on the top of the box with its 10-inch mark coinciding with the front edge of the testing box

**3.5.5 Body Composition** –

SKINFOLD MEASUREMENTS:-

A skinfold is constituted by a double layer of skin plus underlying fatty tissue (subcutaneous fat). For meaning a skinfold thickness, the skinfold is lifted with the help of thumb, forefinger and middle finger of the left hand and the skinfold caliper fold at usually the premarked level.

**Biceps Skinfold Width**

Definition**:** It is the thickness of the double layer of skin plus subcutaneous fat, on the anterior side of upper-arm, over the biceps muscle at a level, mid way between the points acromiale and radiale, measured at a pressure of 10 gram per mm square.

Method**:** The subject with a naked arm is asked to stand at ease with hanging arms. Usually, the mid point of the upper-arm marked previously for measuring upper-arm circumference helps to provide a landmark for measuring biceps and triceps skinfolds. These skinfolds are also to be taken at about 1 cm above the marked level on the anterior side of the biceps muscle. The jaws of the caliper are applied on the fold so that the marked horizontal line is approximately at a level of the mid point of the jaws and that the jaws hold a double layer of skin plus subcutaneous fat (fig.11.17) .The lighter arm of the calliper is slowly released so as to put full pressure of the jaws on the vertical skinfold. The reading is noted from the dial of the calliper about two seconds after leaving the smaller arm of the calliper when the reading is quite stable. The measurement is recorded correct upto0.2 mm.

**Triceps Skinfold Width**

Definition: It is the thickness of the double layer of skin plus subcutaneous fat on the posterior side of the upper arm over the triceps muscle, in the middle of upper –arm.

Method: The method is the same as explained in case of biceps skinfold except that the fold in this case is picked up on the posterior side of upper arm over the triceps muscle.

Anthropometric Tests:

Anthropometric Tests of the left leg of the subject and applies the jaws of the calliper exactly in line with the marked level where the calf circumference was measured (Fig.11.23.). As usually the reading correct up to 0.2 mm is recorded about two second after releasing the full pressure on the jaws of the calliper.

**Fore-Arm Skin fold width:**

Definition**:** It is the thickness of double layer of skin plus subcutaneous fat, on the lateral of skin of forearm at the level where forearm circumference is measured.

Method**:** The method is the same as explained in the case of biceps skinfold except that the skinfold is picked up on the lateral side of forearm about a half circumferential level (fig.11.19). llustration of fore –arm skinfold measurement.

**Subscapular Skinfold Width**

Definition: It is the thickness of double layer of skin plus subcutaneous fat below the inferior angle of left scapula.

Method: The skinfold is picked diagonally below the inferior angle of the , scapula almost parallel to the medial border of scapula, in such a way that the skinfold forms an angle of roughly 45 degrees to the horizontal, with its lower and pointing outwards (Fig.11.20). The jaws of calliper are applied about half a centimetres below the fold picking tip of the thumb. The measurement, as usual, is recorded after two seconds of releasing full pressure on the fold.

**Supra-iliac Skinfold Width**

Definition: It is the thickness of double layer of skin plus subcutaneous fat over the iliac spine , on the left lateral side of the abdomen.

Method: A skinfold is lifted about I centimetres above and 2 cm medial to the anterior superior iliac spine on the left side (Fig.11.21). The jaws of the natural direction of the picked up skinfold which is usually horizontal or slightly oblique pointing upwards latterly and downwards medially. The reading is recorded correct upto 0.2 mm as in all other skinfold measurement.

**Thigh Skin fold Width**

Definition: It is the thickness of the double layer of skin plus subcutaneous fat on the anterior side, at the middle of, thigh exactly at the level of thigh circumference measurement.

Method: The subject is asked to sit on a table with naked middle thigh with legs hanging freely. The Skinfold is picked at a level about 1cm superior to previously marked middle of the thigh (See thigh circumference), on the anterior side of left thigh (Fig.11.22.). The jaws of the calliper are applied exactly in line with the marked horizontal line and the standard pressure of 10 gm/mm2 by slowly leaving the lighter arm of the calliper. The measurement is taken about two second after the full release of the pressure when the reading is stable.

**Calf Skinfold Width**

Definition: It is thickness of the double layer of skin plus subcutaneous fat, on the medial side of calf, in line with the long axis of the leg, exactly at the level of calf circumference.

Method: The subject is asked to sit on the corner of a table top in such a way that his one leg is in front of the longer side of table and the other leg is in front of the breadth side of the table. The tester sits on his feet in between the two legs of the subject and picks up the skinfold on the medial side.

**Achievement motivation: -**

To prepare the present scale, an effort was made to study factors suitable for measuring the achievement motivation. all these factors were accepted for providing the bases to prepare the items in the scale of achievement motivation.

**Criteria for the choice of items in the Scale.**

* The selected item should evolve the achievement imagery in the respondents.
* it should be selected to their achievement experiences based on situation known to them.
* The item should be comprehensible to the respondents.
* The language of the item should be such that the respondent can immediately identify with the situation expressed in the item.
* This questionnaire is of the self-rating type and can be administered in a group. With 5 points to rate viz Always, Frequently, Sometimes, Rarely and Never. It has no time-limit. The Scoring device was simple,

Stencil type having a numerical weightage from 4 to 0 for the positive items and reverse of it for the negative items.

* **Independent Variables**

The following independent variables are as under:

**Dribbling**

1. **Control dribbles (CD)**

Dribble between the legs while walking walk forward while the ball is dribbled with right hand

When the right foot is put forward the ball is bounced between the legs and up into left hand. Now left foot is put forward – then right and then left again while dribbling.

When the left foot is put forward the ball is bounced between the leg and up into the right hand.

1. ***Speed dribbles (SD)*:** The speed dribble is useful when you are not closely guarded, when you must move the ball quickly on the open floor, and when you have a quick drive to goal/shoot.

*Equipment:* Handball, stopwatch, a measuring tape and marking powder.

*Preparation phase*: keep head up and back straight. Feet should be at least shoulder width apart. Weight evenly distributed on the balls of feet. Knees flexed.

*Execution phase*: push the successive dribbles out at waist level. Dribble the ball off finger pads with fingertip control, flexing wrist and fingers to impart force to ball. Keep the non- dribbling hand in a protective position close to the ball.

1. ***Zigzag dribbles (ZD):*** After two balls in a stationary position a greater challenge is to dribble two balls while moving. The moving two- ball dribble will improve the weak hand and strong hand dribbling ability and thus the confidence.

*Equipment*: Handballs, stopwatch, a measuring tape, marking powder and 10 to 12 cones.

*Preparation phase*: keep head up and back straight. Feet should be at least shoulder width apart. Weight evenly distributed on the balls of feet. Knees flexed.

*Execution phase*: dribble two balls up the court in zigzag manner; that is dribbling diagonally to one side and then other. Change direction by crossing both balls in front.

**Catching:** It is the ability to catch a ball securely is a fundamental handball skill. The basic principle in the handling of the ball is to cushion and check its speed. Both hands are used to catch the ball and they should remain flexed.

1. **Jump and catch (J&C):** The jump and catch is useful when you are closely guarded, when you must move quickly to collect the ball and have a quick drive to the goal/ shoot. The distance between the players is 10 meters

*Equipment:* Handballs.

*Preparation Phase:* keep head up and back straight. Feet should ne at least shoulder width apart. Weight evenly distributed on the ball of feet. Knees flexed.

*Execution phase:* when catching the ball, the hands should form a bowl shaped image, by pressing the body weight on the floor and jumps vertically in air to catch the ball.

1. **Run and catch (R&C):** The run and catch is useful when you closely guarded, when you must the ball quickly on the open floor, and when you have a quick drive to the goal/shoot.

*Equipment:* Handball

*Preparation phase:* keep head up and back straight. Feet should be at leat shoulder width apart. Weight evenly distributed on the balls of feet. Knees flexed.

*Execution phase:* The subject starts running towards the direction to the ball theown and tries to catch the ball before it touches the ground.

**Passing:** passing is the most effective way of achieving the offensive objective getting the ball to an open player to set up a scoring opportunity.

1. **Shoulder passes (PS):** This pass must be mastered from both stationary and moving position

*Equipment:* Handballs.

*Preparation phase:* Ball rests on the palm of the passing hand. Balanced stance, relaxed hand position.

*Execution phase:* the leading leg is flexed forward in the direction of the pass, rear leg points slightly to the side. Passing hand is held high and back and bent at the elbow. Non- throwing arm is held across the chest and shoulder’s slightly lowered as the pass is executed. Execution of the pass is led by the elbow, followed by forearm and finally the wrist flick. The final wrist flick is important for adding both control and direction to powerful, accurate pass.

1. **Push passes (PP):** this pass is use when the passer needs to get a pass to a teammate quickly.

*Equipment:* Handballs.

*Preparation phase:* Ball rests on the palm of the hands, balance stance, relaxed hand position.

*Execution phase:* The leading leg is forward and flexed in the direction of the pass, the rear leg points slightly to the side. The ball is held above the waist. The pass is accomplished by a quick snap of the fingers and wrists with the elbow fully extended.

**Shooting:** It is the most important skill in handball. It is a fast and dynamic way of scoring a goal.

1. **Jump shot (JS):** This shot is the most effective shot in the game.

*Equipment:* Handballs

*Preparation phase:* control the ball securely in both hands from the pass directed at him as he advances the speed towards the 6-9 metre- line.

*Execution phase:* Take a long stride, planting the leading foot out, pressing the body weight on to the floor and jump vertically into the air raising left/ right arm to improve the mechanical efficiency of the jump and at the height of the jump, hang back and shoot the ball.

1. **Side shot (SS):** It is the shot instead of shooting high or low to beat the defense the attacker may decide to fire the ball around the side of the covering players.

*Equipment:* Handballs

*Preparation phase:* control the ball securely in both hands from the pass directed at him at 6 meter line.

*Execution phase:* A left/right foot. As he falls to the side he twists his body and shoulders, bringing the ball round low and held out shoot for goal under and round the defender’s arms’ giving him space for additional sight of the goal.

c**. Penalty shot (PS)**

A 7 meter is awarded when a clear chance of scoring is illegally destroyed anywhere on the court by the opposing team player. Also know a foul.

The thrower steps with one foot on the 7- meter line with only the goalie able to defend. All other players must be behind the free- throw line until the shot is made.

**TRAINING SCHEDULE:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Weeks | Weeks 1&2 | | | | Weeks 3&4 | | | | Weeks 5&6 | | | | Weeks 7&8 | | | | |
| Intensity of load | 50% to 60% | | | | 60% to 70% | | | | 70% to 80% | | | | 50% to 60% | | | | |
| Training | Rep | Set | Time (m) | Rest (m) | Rep | Set | Time (m) | Rest (m) | Rep | Set | Time (m) | Rest (m) | Rep | | Set | Time (m) | Rest (m) |
| CD | 25 | 2 | 1 | 1.5 | 30 | 3 | 1 | 1.5 | 35 | 4 | 1 | 1.5 | 25 | | 2 | 1 | 1.5 |
| SP | 8 | 2 | 1 | 1.5 | 10 | 3 | 1 | 1.5 | 12 | 4 | 1 | 1.5 | 8 | | 2 | 1 | 1.5 |
| CP | 8 | 2 | 1 | 1.5 | 10 | 3 | 1 | 1.5 | 12 | 4 | 1 | 1.5 | 8 | | 2 | 1 | 1.5 |
| BP | 8 | 2 | 1 | 1.5 | 10 | 3 | 1 | 1.5 | 12 | 4 | 1 | 1.5 | 8 | | 2 | 1 | 1.5 |
| R&C | 8 | 2 | 1 | 1.5 | 10 | 3 | 1 | 1.5 | 12 | 4 | 1 | 1.5 | 8 | | 2 | 1 | 1.5 |
| SS | 8 | 2 | 1 | 1.5 | 10 | 3 | 1 | 1.5 | 12 | 4 | 1 | 1.5 | 8 | | 2 | 1 | 1.5 |
| PS | 8 | 2 | 1 | 1.5 | 10 | 3 | 1 | 1.5 | 12 | 4 | 1 | 1.5 | 8 | | 2 | 1 | 1.5 |
| ZD | 8 | 2 | 1 | 1.5 | 10 | 3 | 1 | 1.5 | 12 | 4 | 1 | 1.5 | 8 | | 2 | 1 | 1.5 |
| J&C | 8 | 2 | 1 | 1.5 | 10 | 3 | 1 | 1.5 | 12 | 4 | 1 | 1.5 | 8 | | 2 | 1 | 1.5 |
| SD | 8 | 2 | 1 | 1.5 | 10 | 3 | 1 | 1.5 | 12 | 4 | 1 | 1.5 | 8 | | 2 | 1 | 1.5 |
| JS | 8 | 2 | 1 | 1.5 | 10 | 3 | 1 | 1.5 | 12 | 4 | 1 | 1.5 | 8 | | 2 | 1 | 1.5 |
| GAME PRACTICE | 13min (6+1+6) | | | | 13mins (6+1+6) | | | | 13mins (6+1+6) | | | | | 13mins (6+1+6) | | | |

**3.8 Procedure of the study**

1. Pre-test Phase
2. Training Phase
3. Post- test Phase

**Pre-test Phase**

Before test all the subject were instructed about the equipment and event in which they have to participate.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. no.** | **Variables** | **Test** | | **Units** |
| **Health Related Physical Fitness Components** | | | | |
| **1** | **Muscular Strength** | **Push ups** | **Numbers** | |
| **2** | **Muscular Endurance** | **Sit ups** | **Numbers** | |
| **3** | **Flexibility** | **Sit and Reach** | **Cms** | |
| **4** | **Cardio-Vascular endurance** | **9mtr Run & Walk** | **Sec/ mins** | |
| **5** | **Body Compotation** | **BMI** | **Index** | |
| **Psychological Factor** | | | | |
| **1** | **Achievement Motivation** | **Questionnaire** | | **Score** |

**Training Phase**

The total training program of eight weeks and six days per week, which will be conducted only on experimental group, while the control group will be engaged in daily routine work.

|  |  |
| --- | --- |
| **Training Program** | **Duration** |
| Warm up | 10 mins |
| Handball Training | 40 mins |
| Limbering down | 10 mins |
| **Total** | **60 mins** |

**Post –Test Phase**

After the given Handball Training all the subjects (Control and experimental group) was directed to go through test as scheduled in pre-test data was recorded and preserved. The data was analyzed to get findings and conclusions.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. no.** | **Variables** | **Test** | | **Units** |
| **Health Related Physical Fitness Components** | | | | |
| **1** | Muscular Strength | | Push ups | Numbers |
| **2** | Muscular Endurance | | Sit ups | Numbers |
| **3** | Flexibility | | Sit and Reach | Cms |
| **4** | Cardio-Vascular endurance | | 9mtr Run & Walk | Sec/ mins |
| **5** | Body Compotation | | BMI | Index |
| **Psychological Factor** | | | | |
| **1** | Achievement Motivation | | Questionnaire | Score |

**3.9 Statistical Analysis**

The present study was done with the comparison of group. Hence “One Way ANCOVA” was applied.

**LIST OF REFERENCES**

References

Amri Hammami, M. B. (2018 Jan 3). Effects of soccer training on health-related physical fitness measures in male adolescents. J Sport Health Sci.

Augusto César Ferreira De Moraes, R. C.-C.-L. (2019 Jun 18). Is Self-Reported Physical Fitness Useful for Estimating Fitness Levels in Children and Adolescents? A Reliability and Validity Study. Medicina (Kaunas).

Boris Milavic, J. P. (2019 Aug 15). Development and factorial validity of the Psychological Skills Inventory for Sports, Youth Version – Short Form: Assessment of the psychometric properties. PLoS One.

Claudia Zuber, M. J. (2020 Mar). Achievement-Motivated Behavior in Individual Sports: Evidence for the Construct and Criterion Validity of the AMBIS-I Coach-Rating Scale. Journal of Sports Science and Medicine.

Dhapola, R. K. (August-2014). Comparative Study on Sports Achievement Motivation Before and After Competition Among Different Games. Periodic Research.

Eva Ageberg, S. B. ( 2020 Feb 4). Planning injury prevention training for youth handball players: application of the generalisable six-step intervention development process. Inj Prev.

Ireneusz Cichy, A. D. (2020 May 30). Sex Differences in Body Composition Changes after Preseason Training in Elite Handball Players. Int J Environ Res Public Health.

Jürgen Hänggi, N. L. (2015 Apr 27). Structural Brain Correlates Associated with Professional Handball Playing. PLoS One.

Michael D. Garber, M. S. (2014 Sep 25). Geographical Variation in Health-Related Physical Fitness and Body Composition among Chilean 8th Graders: A Nationally Representative Cross-Sectional Study. PLoS One.

Mili, D. A. (2016 Feb). A comparison of sports achievement motivation between the medal winning and non-medal winning athletes in the inter college sports tournaments . International Journal of Physical Education, Sports and Health.

Ming-Te Wang, A. C. (2016 Dec 1). Does Everyone’s Motivational Beliefs about Physical Science Decline in Secondary School?: Heterogeneity of Adolescents’ Achievement Motivation Trajectories in Physics and Chemistry. J Youth Adolesc.

Nenad Stojiljković, A. S. (2020 March). Physiological responses and activity demands remain consistent irrespective of team size in recreational handball. Biol Sport.

Nicola Luigi Bragazzi, M. R. ( 2020 Apr 13). Resistance Training and Handball Players’ Isokinetic, Isometric and Maximal Strength, Muscle Power and Throwing Ball Velocity: A Systematic Review and Meta-Analysis. Int J Environ Res Public Health.

P.T, P. C. (2013 April). A STUDY ON ACHIEVEMENT MOTIVATION AMONG ATHLETES AND HOCKEY PLAYERS . INTERNATIONAL JOURNAL OF BEHAVIORAL SOCIAL AND MOVEMENT SCIENCES.

Phairembam Jiteshw, N. S. (Feb. 2013). Comparative study of the Sports Achievement Motivation between Male and Female School Basketball Players. IOSR Journal Of Humanities And Social Science.

Rodrigo Ramirez-Campillo, F. G.-P.-R. ( 2018 Jul 17). Effects of Different Plyometric Training Frequencies on Components of Physical Fitness in Amateur Female Soccer Players. Front Physiol.

Sarangi, C. (2015 Dec). ACHIEVEMENT MOTIVATION OF THE HIGH SCHOOL STUDENTS: A CASE STUDY AMONG DIFFERENT COMMUNITIES OF GOALPARA DISTRICT OF ASSAM. Journal of Education and Practice .

Souhail Hermassi, A. G. (2019 Jul 5). Effects of short-term resistance training and tapering on maximal strength, peak power, throwing ball, velocity, and sprint performance in handball players. PLoS One.

Sultana, S. H. (2014 Decemer). Factors Affecting Achievement Motivation: A Study on the Selected Industries of Bangladesh. ResearchGate.

Susana C. A. Póvoas, C. C. (2017 Mar 29). Physical and Physiological Demands of Recreational Team Handball for Adult Untrained Men. Biomed Res Int.

Vidar Andersen, M. S. (2018 Nov 15). Explosive Resistance Training Using Elastic Bands in Young Female Team Handball Players. Sports Med Int Open.

Weiyun Chen, A. H.-B. (2018 January 30 ). Health-related physical fitness and physical activity in elementary school students. BMC Public Health.

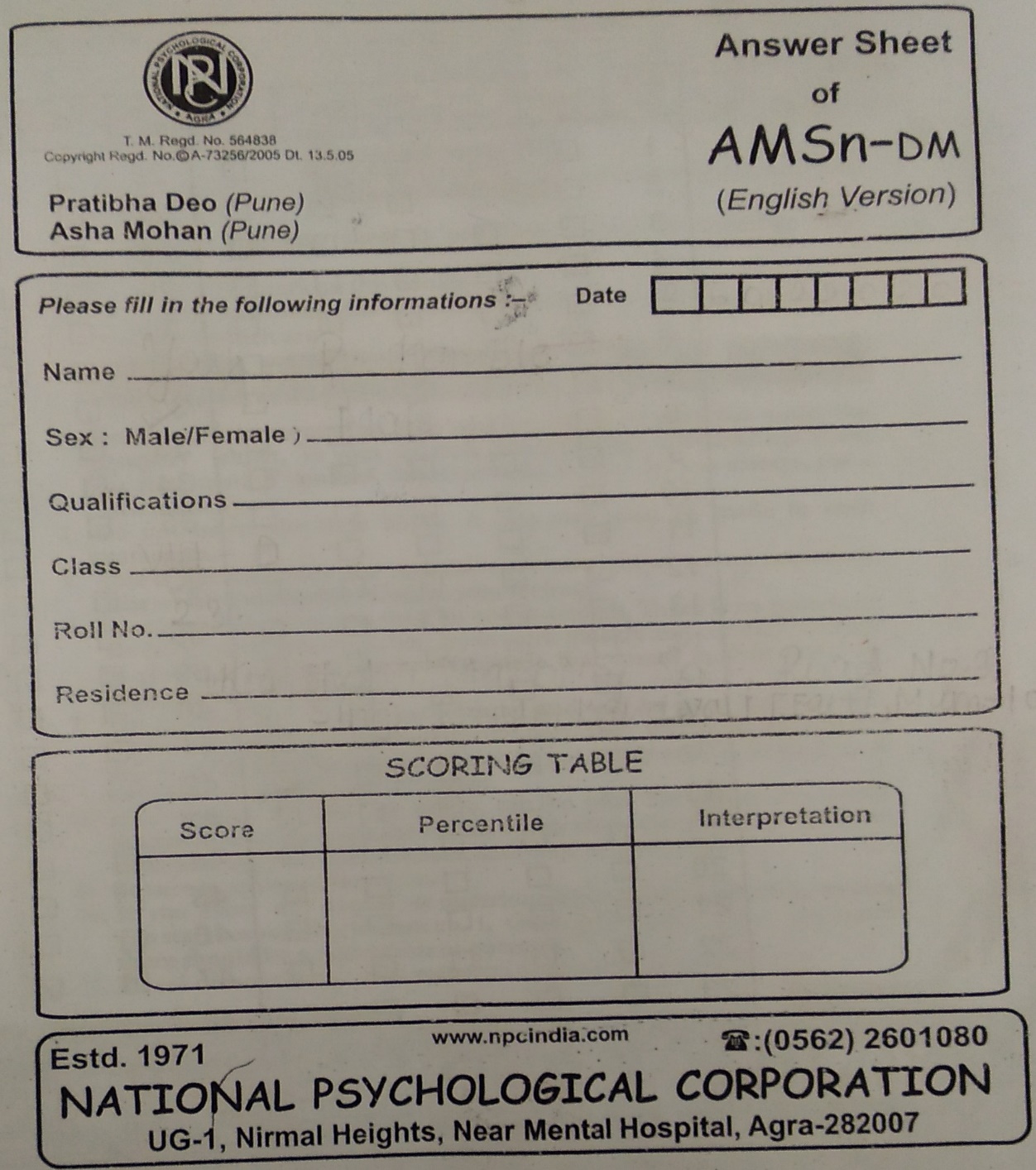
Zheng Zhu, Y. Y. (2017 Sep 6). Prevalence of physical fitness in Chinese school-aged children: Findings from the 2016 Physical Activity and Fitness in China—The Youth Study. J Sport Health Sci.

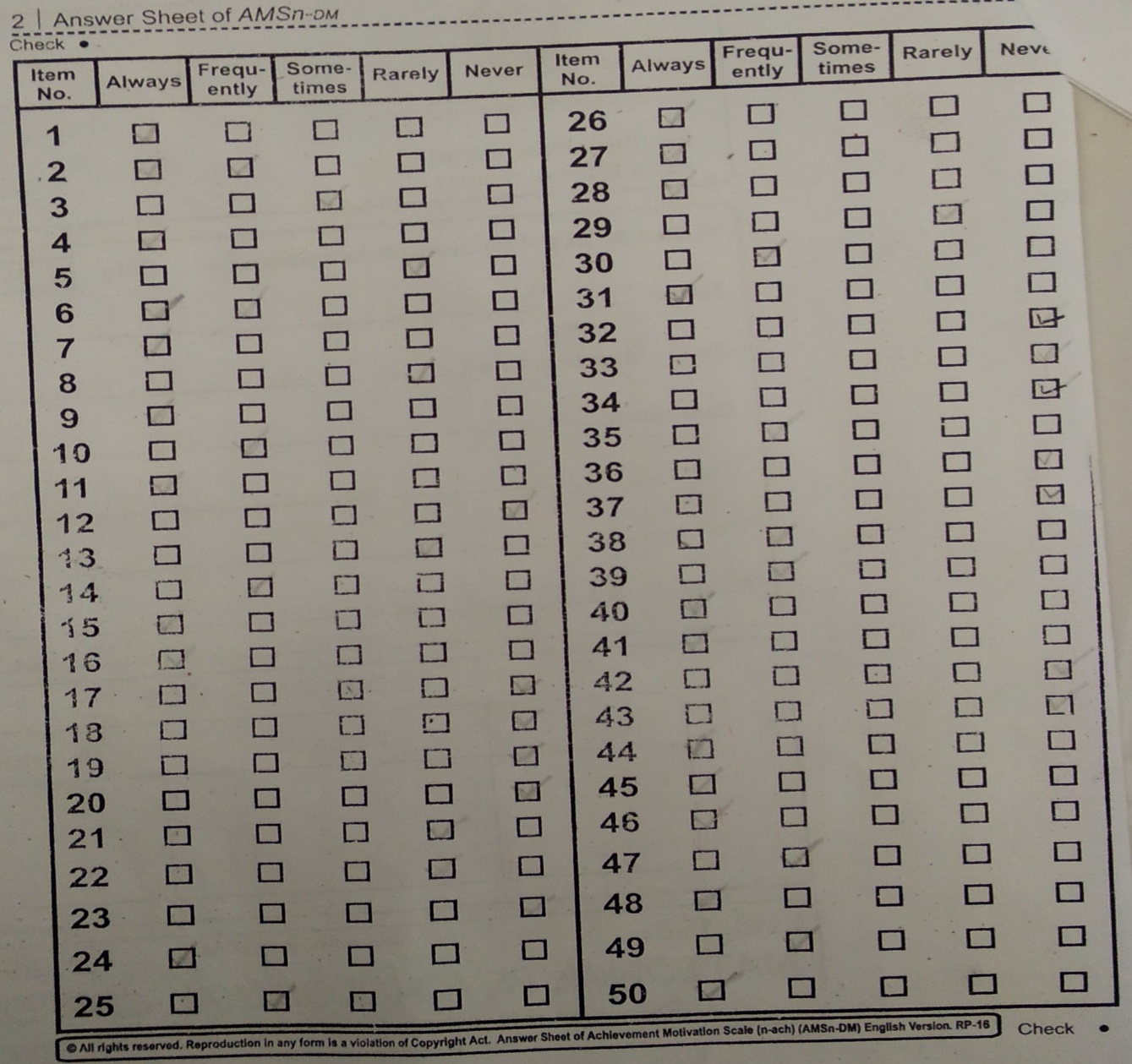
Zhixiong Zhou, S. L. (2019 Nov 11). Impact on Physical Fitness of the Chinese CHAMPS: A Clustered Randomized Controlled Trial. Int J Environ Res Public Health.

Zoran Milanović, S. P. (2015 Aug 25). Health-Related Physical Fitness in Healthy Untrained Men: Effects on VO2max, Jump Performance and Flexibility of Soccer and Moderate-Intensity Continuous Running. PLoS One.

**LIST OF APPENDIX**

QUESTIONNAIRE

****

****

