Chapter II

REVIEW OF RELATED LITERATURE

A careful study and exploration of the related literature is essential to have an idea about the work done within the field. The scholar has given deep thinking to those studies and has gained valuable methodological hints from their procedure and findings, which were of great importance in the formulation and administration of the adapted physical education programme. A brief review of related studies in the field of physical activities for mentally handicapped is presented in this chapter.

Studies Related to Educable Mentally Retarded (EMR)

McMakin\(^1\) conducted a study to evaluate the effects of programmes of physical activity on mentally retarded children. Three classes selected at a random from the primary EMR classes and

---

assigned in to control group, experimental group-I and II. Experimental group-I was provided with a training programme with lesson plans developed by the investigator that consisted activities with cues for left and right. The experimental group-II underwent the programme, which did not stress on left and right. Significant improvement was noticed in directional skills of both the experimental groups and experimental group-I showed much greater improvement than experimental group-II.

Green\(^2\) conducted a study to investigate the effects of a programme of total body movement upon educable mentally retarded child’s ability to understand selected geometric forms. Twenty subjects whose ages ranged from 8-13 yrs and whose IQ ranged from 50 to 75 underwent a programme involving total body movement activities, which incorporated movements of total body through space, contact skills, bilateral movements and selected geometric form,

---

unilateral movements and cross lateral movements were included in the programme. The result of the study indicated that the total body movement programme did not have a significant effect on the educable mentally retarded child's ability to understand selected geometric forms.

Kuklentz\(^3\) investigated the effects of a special programme of physical education for educable mentally retarded children in developing selected motor skills. The criterion measures selected were speed, power, strength, agility and balance. Sixty-seven students selected were divided into two groups; the experimental group underwent a special programme of physical education prepared by the investigator; the control group underwent the programme designed for pupils of normal intelligence of the same age group. The results of the study revealed that: there were significant differences in favour of the experimental group in three of four tests of balance. The difference in the fourth test was not significant, but was in the same direction as the

---

other three tests. There were significant differences in favour of the experimental group on both measures of power. There were no significant differences found on the measures of strength. There were significant differences in favour of the experimental group in both tests of agility. There was a significant difference in favour of the experimental group on the test of speed.

Ebel\(^4\) conducted a study to determine the effect of trampoline training programme on static and dynamic balance of educable mentally retarded children. The subjects were 42 children of ages ranging from 14 to 16 years and their IQs ranged from 46 to 86, as determined by the Stanford-Binnet and Wechsler scales, enrolled in the special education programme of school district. The subjects were divided in to experimental group (23) and control group (19) randomly. Three established tests of static balance were used which consisted of: (i) standing on one foot with eyes open, (ii) standing on one foot with eyes closed, and (iii) standing heel to toe for a

specialized time with eyes closed. Two tests were used to discriminate dynamic balance abilities which consisted of: (i) Rail walking on a four inch wide beam, and (ii) Rail walking on a two inch beam, both eight feet in length. Pre-test and post-test were administered to both the groups, the experimental group was given trampoline training in a sequential task routine for approximately 30 minutes a day, 5 days a week, for a period of 6 weeks. The programme activities consisted of volleyball, bowling, softball, basketball, social dance and physical activities. The data were analysed through t-test and results of the study indicate that both the trampoline training programme and the regular training programme were effected in improving the static balance of educable mentally retarded children. Regarding the dynamic balance, the results indicated that both trampoline and training programme were not effectual in the development of dynamic balance of educable mentally retarded children with in the limited duration of this study.
Chasey and Waneen\textsuperscript{5} conducted a study to find out the effects of physical developmental programme on psychomotor ability of retarded children. The Oseretsky test of Motor Proficiency were administered to 27 educable mentally handicapped children before and after participating in a 15-week physical development programme, and to 20 EMH children not enrolled in the developmental programme. A comparison of pre and post programme performances on the Oseretsky test revealed that the experimental educable mentally retarded group surpassing the control group on the majority of items of the post test.

Chavez\textsuperscript{6} conducted a study to determine if students classified as educable mentally retarded would show significant improvement in agility, power, speed, and strength after participating in one of the three specialized physical education programme. The tests of agility, power, speed and strength were given at the beginning and at the end


\textsuperscript{6} Richardo Chavez, "Effects of Three Physical Education Programme on Selected Physical Fitness Components of Educable Mentally Retardates", \textit{Dissertation Abstracts International}, 31:8 (February 1971): 3929-A.
of a six weeks programme. The t-test for correlated groups was used to determine the significance of mean gains made by each group on tests of agility, power, speed and strength. An F-ratio was used for comparison of the differences between the post-test means on the composite scores of these groups. The result of the study was: an organized six week physical education programme meeting 30 minutes per day, 5 days per week, that used activities related to agility, power, speed, and strength failed to produce significant gains in all these tested components except power. Programme using related activities plus game type activities for the same length and frequency as in the above conclusion did not produce significant gains in power. Subjects who participated in physical education programme which used game type of activities showed much improvement in tested physical fitness components, as did the group participating in related activities. There was no significant difference in relation to the type of physical education programme undergone with the improvement of strength, speed, agility and power scores combined.
Cavanaugh's study on mentally retarded had ten subjects, classified as educable mentally retarded and eight minimally brain damaged children, engaged in a 22 weeks physical education programme consisting of 30 minutes exercises and 60 minutes of vigorous recreational games each day. Both groups showed significant improvement in measures of strength, power, balance, agility, flexibility, cardiovascular efficiency, coordination and speed of response. Although significant gains were found in all but one measure – flexibility test – it was noted that least amount of improvement was found in the more complex tasks requiring several different responses.

---

Studies Related to Trainable Mentally Retarded (TMR)

Pitetti\(^8\) sought to determine whether moderately mentally retarded adults could improve their cardiovascular fitness (CVF) through minimally supervised training programme. 12 trainable mentally retarded adults consisting of 5 females and 7 males between 22-28 years of age with IQ between 58-64 were given a 16-week training programme 50 min/day, 5 days/week. Each subject repeated exercise tests twice on two different modes of exercises, the treadmill (TM) and Schwinn Air-Dyne Ergometer (SAE), before training to ensure validity and reliability of initial cardiovascular fitness levels. Intensity and frequency of the exercise were closely monitored. An observer was present during the training bouts, but only initial instruction was given; no additional instructions and encouragement were given. Although the training programme significantly increased peak VO\(_2\) (29.2 ± 8 to 33.5 ± 9 ml/kg/min) and peak ventilation (73 ± 26 to 81 ± 23/kg/min) when assessed in treadmill, significant changes

in these same parameters were not seen when assessed on the Schwinn Air-Dyne ergometer.

Dupper\(^9\) studied the effects of an aerobic exercise programme on the physiological, cognitive and behavioural functioning of ten institutionalized retarded children. Subjects, ages 12-21 years, were trainable mentally retarded students who were randomly divided into experimental group (group I) and control groups (Group II). Group I participated in a 30-minute aerobic exercise programme, three times per week. Group II spent the same amount of time in participating in a physical education motor skill class. All subjects were evaluated at the beginning and end of a ten week period with Durmun and Rahman skinfold estimate of body fat, the Skubic Hodgkins Step test, 600 yard run/walk, Goal attainment scale, and Vineland Adaptive behaviour scales socialization domain. A post-test revealed a significant improvement among the experimental treatment group within the areas of body fat composition and cardio-vascular efficiency.

---

Cognitive behavioural functioning did not improve as a result of treatment.

Boswell\(^{10}\) studied efficacy of participation in an adapted dance programme based on the model of Riordan (1980) in facilitating change in selected dynamic balance and rhythmic skills of mildly and moderately mentally retarded children. The subjects were 26 mentally retarded children ages 8 to 13 years, who attended Mineralwells Public Schools during the spring of 1982. The subjects were assigned to either the 8 week adapted dance programme or a movement exploration programme of equal duration. Dynamic balance was measured by six balance beam tasks and stabilometer performance. Rhythmic skills were measured by an auditory rhythmic perception test. The findings indicate that although two distinct movement models were employed, the result patterns of change demonstrated great similarity. Significant difference which was found on the most difficult balance beam task included (a) sensitivity of this measure to

initial change, and (b) opportunities for development of spatial orientation skills provided by the dance programme.

Charles\textsuperscript{11} compared the health related physical fitness test and the modified pull-up between mainstreamed EMR/TMR children. Subjects for the study were 126 twelve to fifteen years old TMR children from mainstreamed settings. The subjects were administered the following items – (a) modified sit-ups, (b) sit and reach, (c) 880 yards run, (d) skinfold fat measured (triceps only), and (e) modified pull-ups. Significant differences between normal and mentally retarded children were noted for the modified pull-ups, modified sit-ups, sit and reach and 800 yards run. Non-significant difference between normal and EMR/TMR adolescents were found in the assessment of body fat. Comparison between sexes indicated that fitness trends in retarded populations are similar to normal populations. Males demonstrated significantly more strength and endurance than females. Females were significantly more flexible than males and tended to have greater amount of body fat.

Hussein\(^{12}\) undertook a study to determine the effects of a structured physical activity programme on the physical fitness and self-esteem of TMR individuals, as measured by the AAHPER-Kennedy Foundation Special Fitness Test and Coopermith's Self-Esteem Inventory. These two measures were previously found to be significantly related to standard achievement scores of TMR individuals. 45 TMR persons, 25 male and 20 females, ranging in age from six to twenty years were randomly selected for this study. The IQ of the subjects ranged from 30 to 50 as measured in Stanford Binnet or Weschler Intelligent scale for children. 35 subjects were randomly selected as experimental group and the rest 10 served as a control group. The experimental group participated in a structured physical activity programme for 9 weeks, each day 45 minutes, 5 days a week. Improvement in physical fitness and self-esteem was determined by pre and post-test scores on the AAHPER special fitness

test and self-esteem by self-esteem inventory. Thus the study revealed significant improvement in the experimental group.

Williams\textsuperscript{13} investigated the effects of a prescribed physical activity programme on the arm strength, leg strength, abdominal strength, speed, flexibility, power, coordination, and cardio-respiratory endurance of 60 moderately mentally retarded (MMR), (chronological ages 8-19) with IQs 30-50, subjects were randomly assigned into three groups, designated: experimental, social activity and control. A seven item motor fitness test was administered as pre and post test following a 7-week treatment period. The experimental group engaged in prescribed social activity 30 minutes per day, three times a week, and the control group engaged in their normal activity. Multivariate ANOVA, Univariate ANOVA and Fishers LSD, were used to determine between which group statistically significant differences (P<.05) existed. The experimental group gained significant differences than both the social activity group and the

control group on arm strength, abdominal strength and cardio-
respiratory endurance, and the experimental and social activity groups
made greater gains than the control group on speed.

Funk\textsuperscript{14} studied the effects of a physical education programme
on the physical fitness and motor development of trainable mentally
retarded children. An experimental group of 18 TMR students, age
between 8 to 18 years, were given 30 minutes of planned physical
education training daily for 58 consecutive school days. The 18 TMR
children who served as control group had free play or teacher directed
recreational activity during this time. On two fitness test items, the
shuttle run and sit-ups, the experimental group showed significant
improvement. On the other items the experimental group did not
improve significantly.

\textsuperscript{14} Dean C. Funk, "Effects of Physical Education on Fitness and Motor
Development of trainable Mentally Retarded Children", \textit{Research Quarterly}, 42:1
(March 1971): 30-34.
Goodwin\textsuperscript{15} conducted a study to determine the effects of a traditional physical education programme and a movement exploration programme on physical fitness, IQ and Social Maturity of trainable mentally retarded children. Subjects from opportunity training centre for trainable mentally retarded children of Public Schools were pre and post tested with Hayden Physical Fitness test for the mentally retarded, the Peabody Picture Vocabulary test, and informants (Teachers) provided information for the Vineland Social Maturity Scale on each of the 33 subjects. The subjects were equated in three groups on the basis of chronological age, sex, and result of the pre tests. The study was conducted for 10 weeks with two experimental groups meeting thirty minutes a day, five days a week. The experimental groups were exposed to a traditional physical education programme (group-I), which was group oriented, and a movement exploration programme (group-II) where creativity was emphasized, the third group served as a control group, which included the

\textsuperscript{15}Lane Alden Goodwin, "The Effects of Two Selected Physical Education Programs on Trainable Mentally Retarded Children", \textit{Dissertation Abstracts International}, 31:8 (February 1971): 3933-A.
recreational programme. The results indicated that there was a significant difference in physical fitness of subjects who took up the traditional physical education programme. There was significant improvement between pre and post-test mean scores of both experimental groups exposed to the physical education programme in all three variables tested, physical fitness, IQ and social maturity.

Studies Related to Mentally Retarded (General)

Decker\(^{16}\) conducted a study to evaluate the relative effectiveness and efficiency of forward chaining, reverse chaining and total task presentation in the acquisition of three targeted motor fitness skills with individuals diagnosed as severely mentally retarded individuals. The modified squat thrust were task analysed into seven sub-tasks each. After a screening procedure, six individuals from a Midwestern school were selected and divided into 2 age groups. The subjects were then randomly selected to receive instruction in each of

the motor fitness skills, each paired with one of the instructional strategies. Based on the data obtained, there was no significant difference between forward chaining, reverse chaining and total task presentation in the acceleration, number of trials, time and amount of prompting required to reach criterion on three targeted motor fitness skills. Further there was no significant difference between the three instructional techniques in the retention of three targeted motor fitness skills.

Webber\textsuperscript{17} conducted a study to determine if trisomy 21 down’s syndrome (DS) adolescent males and females could increase their muscular strength significantly more by utilizing a weight training programme than a similar group receiving a strength exercise programme. Fourteen trisomy 21 DS individuals consisting of 3 female and 11 males between 13-18 of age with IQ between 32-52 on the Stanford Binnet Intelligence test were pre tested for each 10 muscular strength tests. The subjects were than match paired and

\textsuperscript{17} Robert C. Webber, “Effects of Strength Development Training Programs for Down’s Syndrome Adolescents”, \textit{Dissertation Abstracts International}, 46:12 (June 1986): 3652-A.
randomly assigned in to two groups, based on weight training and strength exercise programmes. Subjects underwent training programmes for a period of 6 weeks (3 days/week). All subjects were post-test at the conclusion of the treatment period of 6 weeks for the 10 muscular strength tests. Results indicated that weight training programme had made significantly greater gains in muscular strength.

Dhari\textsuperscript{18} conducted a study to compare the effects of massed versus distributed practice on gross and fine motor proficiency of 26 female and 26 male mentally retarded adolescents, aged 180 to 204 months, used a pursuit rotor to practice fine motor skills and stabilometer for gross motor skills. Each subject, whether using a massed or distributed practice schedule, had 15 trials on the first day and 5 trials on the following day. Subjects who followed a distributed practice schedule, had 30 sec. trials with 30 sec. rest between each. Hypothesis was tested using ANOVA at .05 level of significance. The results showed that males using distributed practice on fine motor task

performed better than females; and males using massed practice performed better on motor task than females.

Akers\textsuperscript{19} investigated the gross-motor performance of learning disabled and normal children. The Bruininks-Osersey test of motor proficiency was administered to 40 learning disabled and 40 normal children. Subjects were selected form a summer learning disabilities programme, 8 subjects belonging to 4 chronological age groups ranging from 8 to 12 were selected groups. Results indicated that significant differences in overall gross-motor performance for learning disabled and normal children with the learning-disabled group exhibiting significant deficits in all four areas tested.

Powers\textsuperscript{20} examined the present status of physical education for mentally retarded (MR). The study analysed source materials from the disciplines of special education and physical education to identify


operational guidelines for the development and implementation of adapted physical education programme for the MR in public schools. The guidelines identified were also complaint with mandates of Public law 94-142 of USA, information was obtained in regard to: programme foundation; programme design; physical education assessment for MR; least restrictive environment; programme organisation and administration of services for the MR. A non categorical approach to MR was used. The result found that adapted physical education programme can be appropriately developed and implemented in a design concurrent with the goals and objectives of regular physical education, as well as be an effective and positive element in the delivery of special education services to the MR students to participate in a variety of educational services individually designed for the least restrictive environment. It is concluded that no single theoretical programme model of operational design can be successful if implemented in an immediate approach.
Reid et al\textsuperscript{21} conducted a study to clearly describe motor performance and anthropometric and fitness status of autistic children. Twelve subjects were chosen from a school for multiply handicapped and from hospital setting. The subjects were divided into two groups, a young group, mean age 10.2 years, range 8.3-12, and older group, mean age 16.6 years, range 14.8-19.4. Tests are sit-and-reach flexibility test using a modified Wells and Dillon flexometer, catching and balance from Bruininks-Oseretsky test of motor proficiency. The remaining items were taken from a study conducted by Rarick, Dobbins and Broadhead (1976) which included: anthropometric and fitness measures of height, weight, left and right grip strength (hand dynamometer) abdominal strength (sit-ups); and estimated body fat a well as following performance measures – vertical and horizontal target throw, standing long jump, mat crawl and scramble. The items believed to provide a broad assessment of the motor domain. Results are compared with various groups. The young autistic group

demonstrated less grip strength than the young mentally retarded children and non-retarded group; both groups of autistic subjects demonstrated a large deficit in trunk flexion. The autistic individuals performance was inferior to other groups on the balance and target throwing tasks. The present data support previous research and clinical reports, which argued that autistic persons do not perform motor skills at a rate consisted with their chronological age. It recommends individualized instruction using contemporary educational technology probably is necessary for these youngsters to develop motor skills.

Lewis^22^ studied the effects of participation in 12 weeks individualized data base instructional programme on physical fitness of severely retarded female adolescents, randomly assigned into experimental and control group. Four instructors used the least prompt instructional system to teach each subject in the experimental group, two flexibility and five muscle endurance exercises. A multiple

baseline design was used to analyze the data and demonstrate the efficacy of the instructional intervention on the subject's ability to independently and correctly perform the exercises and three subjects learned all the seven exercises.

Tucker\textsuperscript{23} conducted a study of evaluate the effect of individualized motor activity programme upon motor development, perceptual motor development, physical fitness, self-concept and academic achievement of 37 learning disabled children of chronological ages between 7 and 12 years. Subjects were divided into two groups, experimental and control groups. Experimental group underwent an individualized 18 weeks instructional training programme, and the control group experienced a traditional physical education programme. Results of the study indicated that the level of physical fitness, motor ability, and perceptual, motor development can be enhanced through participation in an individualized motor activity programme.

Poehlman\textsuperscript{24} studied the effects of a three-part experimental physical education programme on fitness level of mentally retarded children. The purpose of the study was to determine the effects of an experimental physical education programme, which combined a jog/walk activity, calisthenics and individual exercises on physical fitness of mentally retarded children. The selected subjects were 15 males and 15 females from the special education classes of Bellefonte Elementary School, P.A. and Community School, Tehran, Iran. Each subject participated in an eight weeklong experimental physical education programme. Each subject was pre and post-tested using modified AAHPER test, special fitness test for mentally retarded. Dependent ‘t’ tests for within group comparisons on sub test scores and on the fitness independent ‘t’ test for comparison between the two schools were used in the data analysis. Result showed a significant increase in physical fitness as indicated by the sub test

scores from the modified AAHPER special fitness test for the mentally retarded.

Jenkin's study states that certain factors in mentally retarded individuals can improve. Two groups (N = 10) were equated with respect to IQ and chronological age. The experimental group received approximately one hour of individual and/or group instruction in selected physical education activities daily for a period of 7 weeks, whereas the control group followed the usual regime of the Denton state school. The basic movements emphasized during the instructional programme of physical education were walking, running, jumping and hopping. Proficiency in the basic movements were measured by means of the following tests: the Health-Rail Walking test, the 30 yards dash and the standing broad jump test. The investigator devised an original test to measure proficiency in hopping. The experimental group showed significant improvement in rail walking, broad jump and hopping, whereas no significant

changes were obtained in running speed. The motor proficiency of the control group did not change.

Elord\textsuperscript{26} studied the effects of sequential and structured perceptual motor training programme on the development of perceptual motor skills as measured by Purdue Perceptual Motor Survey and general behaviour is observed in class room activities. Subjects were selected and divided into two groups. The method of research was the case study method. The result revealed that combined perceptual motor skills of educable mentally retarded children.

Devis\textsuperscript{27} conducted a study to explore the relationship between body image boundary and physical fitness in mentally retarded subjects. Subjects had an IQ range of 30 to 78 and age range of 12 to 20 years. The Holtzman Inkblot Test and AAHPER-Kennedy special


fitness test were used to evaluate the body image boundary and physical fitness. The results obtained were: In terms of relations between the body image boundary aspects and fitness status, significant relationships between the barrier score and fitness measures were found with both male and female groups for which shuttle run and sit-ups were the significant related tests. The number and extent of relations were not to be conclusive, but study did not support the supposition that a higher level of physical fitness necessarily contribute to the social adjustments of retardates.

Owens\textsuperscript{28} studied the effects of a 20-day programme of physical education (1 hour daily) on the intellectual development and social status of eight educable mentally retarded boys. The subjects were observed by a group of eight officials (who kept records and rated the training group in an attempt to study the Hawthorn effect) and the control group of eight subjects (who remained in their usual class room programme). The subjects were attending special day classes,

were aged between 16-17 years, and had IQs between 50 to 80 on the Wechsler Intelligence Scale for Children (WISC), the Youth Fitness Test and Cowell Personal Distance Scale were administered before and after the programme. The WISC full scale, verbal scale, and performance scale IQ’s were analysed by analysis of variance, and the test of differences between two groups was applied. The training group made significant full scale IQ and verbal scale IQ gain scores over the control group. On Youth Fitness Test every boy in the training group showed improvement on every subtest, and group as a whole made significant gain scores over the officials and the control group.

Studies Related to Motivational Techniques

Dutta\textsuperscript{29} conducted a study to determine the effect of motivational techniques on the performance of young swimmers. Twenty young swimmers of Greater Gwalior, age ranged from 8 to 13

years was divided into two groups (Equated Group Design). Group A (n = 10) underwent swimming training programme alone (control group) whereas Group B (n = 10) underwent the regular swimming training programme with motivation (experimental group) for a period of six weeks. The motivational techniques used were extrinsic rewards and social reinforcement. Total distance swam in five minutes time period was taken as swimming performance. The data were analysed using 't' ratio.

a) There was a significant effect of motivation on the performance of swimming in comparison to the initial performance of the experimental group.

b) There was a significant effect of motivation on the swimming performance in comparison to that of no motivation.

Mc Caughan and Gimbert\(^{30}\) obtained data from 45 female high school students, ranging in age from 13 to 15 years studying in 8\(^{th}\) Standard of Australian High School to examine the effects of positive.

negative and non-reinforcement during performance of a fine motor task to observe any expectancy and performance difference. Subjects first learned the task and then were given a series of 30 trials in which social reinforcement was administered non-contingently. Positive social reinforcement had a significant effect on performance, while both positive and negative reinforcement had significant effects on expectancy. In addition, disparate attribution was made by each treatment group.

Mc Caughan and Mc Kinlay\textsuperscript{31} conducted a study to assess the effects of success/failure and extrinsic rewards on intrinsic motivation in performing a motor task. The subjects for this study were sixty high school girls. A questionnaire was administered to check for the degree of satisfaction after participation under each experimental condition. A significant change in intrinsic motivation was found to be due the effects of success and failure. Through there was a positive change in intrinsic motivation due to tangible rewards but was insignificant.

Those groups received success feedback persisted longer at the voluntary play situation than did those received failure feedback.

Perry\textsuperscript{32} conducted a study to determine the effect of individualized extrinsic motivational techniques on the performance of vertical jump and handgrip tests. Subjects for this study were sixty, ninth grade females. Three techniques selected by 76 percent of the total population became the motivational treatment groups. They are, “School Award”, “Exemption from the final examination with an ‘A’ Grade on the examination”, “Being told I can do better”, and a control group. Fifteen subjects were randomly placed into each of the four groups. Three trials were administered during the pre and post-testing. A significant difference was found between initial and final test scores on both tests of experimental groups. Although a significant difference was not found between the conditions, the social praise condition appeared to have a greater and more consistent effect on strength/power test scores, than did the tangible reward condition. All

the three experimental conditions produced greater increase in test scores than did the control group.

Rushall and Pettinger\(^{33}\) investigated the effect of various reinforcers used as motivators in swimming where three kinds of rewards were contrasted as to their effect upon swimming work volume. Subjects for this study were from a swimming club (N = 32) and their age ranged from 9 to 15 years. The experimental design used was eight independent replication of a 4×4 latin square. Extrinsic reinforcers of candy, money improved the performance significantly over coach’s attention and control condition. The effects of these conditions were affected differently by age.

Summary

The results of the majority of the reviewed literatures support the effectiveness of specially designed physical education programmes in improving the physical fitness of educable and trainable mentally retarded individuals.

Studies pertaining to the effectiveness of adapted physical education programmes / specially designed physical education programmes on motor performance of educable and trainable mentally retarded individuals have shown contradictory results i.e. some of the studies have shown significant improvement while other studies shown insignificant improvement.

Comparative studies revealed the existence of significant difference between the normal and mentally retarded children of the same age group in physical fitness as well as in motor performance.

As such there was no critical literature available related to the effect of reward on motor performance of mentally retarded, the available allied literatures reveals the existence of significant improvement in motor task, strength and power & swimming.
performance in normal individuals due to the implementation of some of the motivational techniques.

There seems to be an agreement on findings among the studies related to the effect of adapted/special physical education programme on physical fitness variables but more of a conflict than agreement among the findings related to motor performance variables of EMR and TMR individuals. A replication of similar studies would be needed to draw general conclusions.