



## MARTIAL ARTS: AN EXCELLENT EXERCISE TO IMPROVE PSYCHO-SOCIAL HEALTH IN CHILDREN.”

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### **PRESENT KNOWLEDGE**

Martial arts can be defined as body, mind and spiritual practices originated in china. There are Various patterns/types of Martial Arts like judo, karate, jujutsu, taekwondo, aikido, hapkido, kickboxing, taichi etc. India is also an origin of a Martial Arts pattern/type known 'Kalari payattu. 'Besides, judo, karate, taekwondo and kickboxing is also used widely in india. In ancient times, Martial Arts were practiced for self defense, now they are practiced for fitness, sport, self regulation, mental and spiritual development and also as an alternative therapy for some medical conditions.

Martial Arts can be a catalyst for developing physical performance, self confidence, concentration, self discipline, self esteem and complete character development in children. Martial Arts have been found to be effective in improving:

- Physical health in children such as increased physical confidence
- (Finkenber 1990), improved self-perceptions of physical ability (Richman & Rehberg 1986), enhanced body image (Guthrie 1995), increased
- Cardio-respiratory fitness (Melhim 2001) etc.
- Psychological health such as higher Self esteem (Finkenber 1990,
- Trulson 1986), more positive response to physical challenges (Fuller
- 1988), emotional stability and assertiveness (Konzak & Boudreau 1984),
- Increased self-confidence (Duthie et al 1978, Konzak & Boudreau 1984),
- Improvement in concentration and learning to be more respectful of others (Konzak & Boudreau 1984).

Because of the increasing benefits of Martial Arts, many countries in the world have introduced Martial Arts during physical education classes in secondary schools (Theebom and De knop 1999). Also, many schools in India have started Martial Arts classes for children. Childhood development experts recommend that children of age more than 5 years should participate in physical and mental activities to encourage physical maturity, personality growth and socialization with others. Also, due to increasing violence and abuse, there is a need for self defence practices for girls. Martial Arts

can be an excellent alternative for girls instead of any other physical exercise.

Martial Arts will definitely fulfill all these requirements with excellent results.

### **AIMS AND OBJECTIVES :**

1 ) To study the effects of Martial Arts training on Psycho-Social health in children.

2) To suggest suitable recommendations based on the findings of the study.

### **MATERIAL AND METHODS:**

The present study was carried out at a public school in Central India with the objectives to study the effects of Martial Arts training on Psychosocial health in adolescent children (girls)

**Study type:** Experimental study

**Study setting:** Public School in an urban area.

**Study participants :** Girls in age group 9-15 years[STD IV to VIII] from the public school.

**Study period :** June 2014 to september 2014

### **METHODOLOGY:**

Permission from Chief Administrator of the School has been taken before commencing the study. Details of the study such as objectives, duration, study method etc were explained to parents of each participant. Written consent was obtained from parents of each participant. Data collection was done through pretested, structured proforma.

### **EXCLUSION CRITERIA :**

- 1) H/o Hospitalisation due to any Disease/Disorder in last 1 month
- 2) H/o any fracture/dislocation in the last 12 months
- 3) H/o any major surgery done in last 12 months.
- 4) Presence of any physical deformity.
- 5) H/o involvement in any Martial Arts activity in last 6 months.
- 6) H/o involvement in any Martial Arts training currently.
- 7) H/o member of any sports club and representing at state / national level with continuous practice in the last 6 months.

The 100 students were divided into 2 groups randomly by using lottery method as follows: 1<sup>st</sup> group - 50 students for Karate training and 2<sup>nd</sup> group 50 students - not receiving Karate training.

At **baseline**, following variables were measured (for both the groups):

1) Height was measured by measuring tape nearest to 0.5 cm.

Weight was measured by weighing machine to the nearest 0.5 kilogram and

BMI was calculated. [BMI = Weight (kg) / Height<sup>2</sup> (m)]

2) Psycho-Social health was assessed by using Pediatric Symptom Checklist 17 (PSC)

The PSC 17 is a strongly validated instrument to assess psychosocial problems in Children. The Pediatric Symptom Checklist-17 (PSC-17) is a psychosocial screen designed to facilitate the recognition of cognitive, emotional, and behavioral problems so that appropriate interventions can be initiated as early as possible.

The PSC-17 consists of 17 items that are rated as "Never," "Sometimes," or "Often" present. A value of 0 is assigned to "Never", 1 to "Sometimes," and 2 to "Often". The total score is calculated by adding together the score for each of the 17 items. Items that are left blank are simply ignored (i.e., score equals 0). If four or more items are left blank, the questionnaire is considered invalid. A PSC-17 score of 15 or higher suggests the presence of significant behavioral or emotional problems.

The PSC consists of 3 Domains:

(a) **Attention problems** : describes problems in attention, concentration etc.

(b) **Internalizing problems**: describes anxiety and/or Depression.

(c) **Externalizing problems**: describes conduct disorders like aggression, violence, disobedience etc.

To determine what kinds of mental health problems are present, determine the 3 factor scores on the PSC:

The PSC-17 **Internalizing Subscale** (Cut off 5 or more items):

- Feels sad, unhappy
- Feels hopeless
- Is down on self

- Seems to be having less fun
- Worries a lot.

The PSC-17 **Attention Subscale** (Cut off 7 or more items):

- Fidgety, unable to sit still
- Daydreams too much
- Has trouble concentrating
- Acts as if driven by a motor
- Distracted easily.

The PSC-17 **Externalizing Subscale** (Cut off 7 or more items):

- Refuses to share
- Does not understand other people's feelings
- Fights with other children
- Blames others for his/her troubles
- Does not listen to rules
- Teases others
- Takes things that do not belong to him/her

1<sup>st</sup> Study Group was given Karate Training 5 days/week for 2 months. (1 hour/day)

2<sup>nd</sup> Study Group included children not receiving any Martial Arts training but involved in any sport (1 hour/day 5 days/week) for 2 months.

All the baseline investigations were again carried out on the 100 students after 2 months and the data was analysed.

#### **STATISTICAL ANALYSIS:**

Categorical variables were summarized in the form of percentages and continuous variables in the form of means and standard deviations 'Paired t test' was used to compare means at baseline and at 2 months within each group. 2 groups were compared using 'unpaired t test'.

## **RESULTS:**

**Table 1: Distribution of 100 students according to socio-demographic characteristics:**

Characteristic	Classification	No. (N=100)	Percentage
<b>Age-group (years)</b>	09-11	35	35
	11-13	34	34
	13-15	31	31
<b>Religion</b>	Hindu	36	36
	Muslim	23	23
	Buddhist	29	29
	Others	12	12
<b>Socio-economic status*</b>	I-Upper	19	19
	II-Upper Middle	39	33
	III-Lower Middle	33	39
	IV-Upper Lower	09	09

Table no. 1 shows that out of 100 students, 35 were between 9-11 years and 34 between 11-13 years of age whereas 31 were between the age group of 13-15 years.

Majority students i.e 36 belong to Hindu religion followed by 29 Buddhists and 23 Muslims. Other religions viz Christians, Sikhs and Parsis accounted for 12.

As per modified Kuppaswami scale, 39 belonged to upper middle class, 33 to lower middle class, 19 to upper class and 9 students belonged to upper lower class.

**Table 2: Distribution of students with respect to Body Mass Index (BMI) in both groups**

BMI	Karate (n=50)				Control (n=50)			
	At baseline		At 2 months		At baseline		At 2 months	
	No.	%	No.	%	No.	(%)	No.	%
<18.5	10	20	14	28	12	24	9	18
18.5-22.9	28	56	32	64	22	44	28	56
≥23	12	24	4	8	16	32	13	26
Total	50	100	50	100	50	100	50	100

Karate (n=12)		Control (n=16)	
At baseline	At 2 months	At baseline	At 2 months
24.51 ± 1.61	23.34 ± 1.15	25.44 ± 1.79	25.23 ± 1.58
P = 0.001		P = 0.088	

Above table shows that in karate group, after intervention, the percentage of students with BMI <18.5 increased by 8 % (20 % vs 28 %), with BMI 18-22.9, the percentage increased by 8 % (56 % Vs 64%), with BMI > 23, it decreased by 20 % (24% Vs 4 %).

In control group, percentage of students with BMI <18.5 decreased by 3 % (12% vs 9%). The percentage increased by 6 % with BMI 18-22.9 (22 % Vs 28 %), with BMI > 23, it also decreased by 3 % (16 % Vs 13 %).

**Table 3: Group-wise change in mean BMI from baseline among overweight subjects. (n=28)**

Above table shows that the Mean BMI value and SD of students in Karate group was significantly reduced from 24.51 and 1.61 to 23.34 and 1.15 respectively after intervention. (p = 0.001)

In control, the mean and SD before and after intervention are 25.44 and 1.79 and 25.23 and 1.58 respectively.

**Table 4: Change in Mean Total Pediatric Symptom checklist (PSC) score from baseline by groups**

Table 4 shows that the Mean total PSC score and SD of students in Karate group decreases from 18.08 and 7.56 to 17.53 and 7.15 respectively after intervention. Significant decrease in PSC score has been found in Karate students after training. (p = 0.014)

In Control, the mean with SD before and after intervention are 22.17 with 6.44 and 21.35 with 5.01 respectively.

**Table 5 : Distribution of study subjects according to PSC subscales.**

PSC subscales	Karate (n=50)				Control (n=50)			
	At baseline		At 2 months		At baseline		At 2 months	
	No.	%	No.	%	No.	(%)	No.	%
Attention problems	7	11.66	5	8.34	7	10.93	6	9.37
Internalizing problems	10	16.67	7	11.66	8	12.51	6	9.35
Externalizing problems	9	15.00	6	10.00	7	10.93	7	10.93
Total	26	43.33	18	30.00	22	34.37	19	29.68

Above table shows that the percentage of students with attention problems in Karate group reduced to 8.34 % after 2 months from 11.66% while in control group, the percentage reduced to 9.37 % from the baseline 10.93%. Also, in Karate group, the percentage of students with internalizing problems reduced to 11.66% from 16.67% and in control, it was 9.35% from 12.51%. The % of externalizing problems also reduced to 10% from 15% in karate, while it remained unchanged in control group.

**Table 6 : Group-wise change in Mean PSC subscale scores from baseline among study subjects.**

PSC subscales	Karate (n=50)		Control (n= 50)	
	At baseline	At 2 months	At baseline	At 2 months
<b>Attention Problems</b>	7.85 ± 0.89	6.71 ± 0.91	8.42 ± 0.97	8.00 ± 1.41
	<b>P = 0.007</b>		P= 0.099	
<b>Internalizing problems</b>	6.90 ± 1.10	5.0 ± 1.24	7.87 ± 0.83	7.62 ± 1.18
	<b>P=0.000</b>		P= 0.175	
<b>Externalizing Problems</b>	8.11 ± 1.26	6.66 ± 0.86	8.85 ± 1.21	8.42 ± 1.27
	<b>P= 0.007</b>		P= 0.099	

Table 6 shows that the Mean Attention problems score and SD of students in Karate group decreases from 7.85 and 0.89 to 6.71 and 0.91 respectively after intervention. Significant decrease in PSC score has been found in Karate students after training. (p = 0.007)

In Control, the mean with SD before and after intervention are 8.42 with 0.97 and 8.00 with 1.41 respectively. The Mean Internalizing problems score and SD of students in Karate group reduced from 6.90 and 1.10 to 5.00 and 1.24 respectively after intervention. This change was significant. (p = 0.000)

In Control, the mean with SD before and after intervention are 7.87 with 0.83 and 7.62 with 1.18 respectively with no significant change. In externalizing problems also, the mean score and SD of Karate group significantly reduced from 8.11 and 1.26 respectively to 6.66 and 0.86 respectively after 2 months (p= 0.007) while in control group no significant change was found.

### **SUMMARY AND CONCLUSIONS**

Martial Arts like karate has been found to improve the Physical and Mental health of participants as evidenced by variety of studies and these sports are particularly useful for children and adolescents. The present interventional study was carried out in a public school in central India to study the effects of Martial Arts (Karate) training on Psycho-Social health in children .

Total 100 students in the age range of 9-15 years (studying in std IV to std VIII) were selected from the public school. At baseline the Psycho- social health of the students was assessed using PSC 17. Then the students were randomly divided into Karate and control group. The Karate students were given the respective training for 2 months ( 1 hour/day 3 times a week).

The following conclusions were drawn depending upon the observations and results of the present study:

- **Sociodemographic characteristics and classification of students in various groups**
- The majority of the students ( 35%) were 9-11years old.
- The majority of the students (36 %) were Hindu.
- The majority of the students (39%) belonged to lower middle class .
- **Comparison between the effects of Karate and control on the Psycho-social health in children.**
- ❖ **Significant difference was observed after 2 months of training in Karate group:**
- The Mean BMI of 12 overweight students reduced (p=0.001).
- The Mean Total PSC score reduced ( p= 0.014)
- The Mean Attention problems score reduced ( p= 0.007 )
- The Mean Internalizing problems score also reduced ( p= 0.000)

- The Mean Externalizing problems score also decreased (p= 0.007)

### **RECOMMENDATIONS**

Specific recommendation based on study conclusions are as follows:

- Martial Arts like Karate should be included in the school curriculum for improving the Physical and Psycho-social health of the children.
- Martial Arts should be used in management of overweight and obese children.
- Martial Arts should be used in management of Emotional and Behavioral problems in children.

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