

From the Standpoint of Health Education Administrators in Japan: An attempt in Fukuoka Prefecture

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Introduction

In Japan, medical examinations for schoolchildren and students are prescribed under School Health and Safety Act (formally School Health Law). With regard to items concerning musculoskeletal system, spinal examinations focusing on scoliosis were introduced under partial amendment of School Health Law Enforcement Regulations in 1979, and careful examinations of any bone or joint abnormalities and the condition of the limbs have been required since 1994. However, medical examinations of musculoskeletal system at many schools are conducted by school physicians who are internists or pediatricians; not by orthopedists.

In recent years, children's health problems have diversified, ranging from chronic disorders such as allergic diseases to mental health-related problems. With regard to musculoskeletal systems, too, there has been an increase in the number of children with musculoskeletal disorders and injuries caused by excessive exercise and sports activity, as well as those caused by lack of exercise and sports activity. The majority of these modern health issues are thought to require appropriate treatment from specialists. The "Integrated Projects of Community Health Specialists for Children's Health Protection," a project commissioned by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT), has been implemented with the purpose of accumulating knowledge about measures for resolving issues in model communities in order to respond



appropriately to the modern health problems of children.

In Fiscal Year (FY) 2008, Fukuoka City Board of Education conducted a survey of school staff attitudes regarding musculoskeletal problems

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Table 1 Survey of school staff attitudes regarding musculoskeletal problems: questionnaire items and results

	School nurse teachers (%)			Chief teachers of physical education (%)		
	Yes	No	No response	Yes	No	No response
1. Have you ever heard the term <i>musculoskeletal system</i> ?	50.7	48.4	0.9	33.2	66.8	0.0
2. Do you know the meaning of the term <i>musculoskeletal system</i> ?	45.2	53.9	0.9	25.0	75.0	0.0
3. Have you ever heard the term <i>musculoskeletal disease</i> ?	44.8	54.3	0.9	30.0	70.0	0.0
4. Do you think children's bones differ from those of adults?	100	0.0	0.0	96.3	3.2	0.5
5. Do you think that muscle training for children differs from that for adults?	99.5	0.5	0.0	99.5	0.0	0.5
6. Do you think that sprains can accompany ligament tearing?	83.2	16.3	0.5	62.7	36.8	0.5
7. Do you think that sprains in children can accompany bone fractures?	94.5	5.0	0.5	85.5	14.5	0.0
8. Do you think <i>tennis/baseball elbow</i> may sometimes require surgery?	95.5	3.6	0.9	95.9	4.1	0.0
9. Have you heard of <i>Osgood-Schlatter disease</i> ?	96.8	3.2	0.0	62.3	37.7	0.0
10. Do you think that a stress fracture will heal naturally?	33.5	66.0	0.5	49.5	48.2	2.3
11. Do you think the incidence of bone fractures and external injuries in your school is increasing?	91.4	6.8	1.8	88.6	10.9	0.5
12. Is an instructor or coach supervising the warm-up stretching?	—	—	—	87.7	10.5	1.8
13. Have you ever received any notification or asked for consultation from the parents/guardians that the child has a sports-related disorder?	61.1	38.9	0.0	39.1	60.9	0.0
14. Do you think that the occurrence of sports-related disorders is connected to the length of practice time?	88.2	11.3	0.5	78.2	20.9	0.9
15. Are there any reference materials on sports-related disorders available at your school or training sites?	45.7	54.3	0.0	25.5	73.1	1.4
16. Do you think sufficient preparations are being made to prevent the occurrence of sports-related disorders in your school?	12.7	85.0	2.3	16.4	82.7	0.9
17. Do you think that the treatment for external injuries provided by your school is appropriate?	79.2	16.3	4.5	95.0	4.5	0.5

and also implemented musculoskeletal examinations on students at 2 schools designated as the model schools.

Survey of School Staff Attitudes Regarding Problems Related to Musculoskeletal System

Attitudes of school staff regarding musculoskeletal problems were investigated using a questionnaire sheet in order to clarify the current status of their attitudes and issues regarding musculoskeletal system.

Subjects and methods

School nurse teachers and chief teachers of physical education working at 227 public schools in Fukuoka City (Fukuoka Prefecture, Japan) were requested to answer a questionnaire. Responses

were received from 211 school nurse teachers and 220 chief teachers of physical education.

Results

Questionnaire items and the results are shown in **Table 1**.

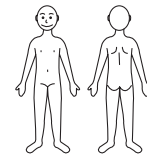
Awareness towards musculoskeletal system and musculoskeletal disorders in school cannot be said to be sufficient. Only 50.7% of school nurse teachers and 33.2% of chief teachers of physical education responded that they had heard of the term *musculoskeletal system*, and some 37.7% of chief teachers of physical education answered that they had never heard of *Osgood-Schlatter disease*. Moreover, even though many were aware of increasing incidences of bone fractures and external injuries among children, the survey results indicated a lack of reference materials on sports injuries and insufficient

Table 2 A written interview sheet prepared by Japanese Committee of Bone and Joint Decade: preliminary version (February 2007)

School year: _____ Name: _____

Please check (✓) the answer that is most applicable to you, and provide additional information in the space provided when needed.

- Have you ever received treatment for injuries or damage to your bones, joints, or the spine (orthopedic, chiropractic, or any other treatment)?
 If so, please write down your age at the time of your treatment and the body part that was treated (e.g., age 10 / knee)
 No
 Yes [(Specify) _____]
 ↳ 1-2 Do you still experience pain or problems resulting from this injury or damage? If so, please provide the specific details. (e.g., the elbow joint does not extend completely.)
 No
 Yes [(Specify) _____]
- Are you currently undergoing treatment for injuries or damage to your bones, joints, or the spine (orthopedic, chiropractic, or any other treatment)?
 If so, please describe the type of injury or damage being treated?
 No
 Yes [(Specify) _____]
 ↳ 2-2 Where are you receiving your treatment? (Circle all applicable answers.)
 Orthopedic hospital/clinic Chiropractic clinic Other [(Specify) _____]
- Do you have pain in any part of your body at present or in the past?
 If so, please circle all that apply from the list and also circle the applicable body parts in the diagram (please mark all that apply).
 (Circle all body parts that apply.)
 Not applicable
 I have had pain in the following area(s).
 ↳ Neck Shoulder Elbow Wrist Upper back Lower back
 Groin Knee Leg Heel
 Other [(Specify) _____]
- Do you belong to any athletic team or sports club (including any school clubs, sports teams, or lessons like dance or theater that involve any repeated physical exercises)?
 No
 Yes _____]
 ↳ 4-2 What type of sports/physical activity are you involved in?
 (If you have more than two, write down the two main activities.)
 1 [_____] 2 [_____]
 4-3 If you play in a particular position in your sport, please specify.
 (e.g., pitcher in baseball, attacker in volleyball, forward in soccer)
 No
 Yes [_____]
- If you have experienced any symptoms of concern regarding your bones, joints, muscles, or the spine (any parts of the musculoskeletal system), please describe in detail.
 [_____]



preparations to prevent injuries.

Musculoskeletal Examinations

Subjects and methods

A written interview sheet (preliminary version,

prepared jointly by Japanese Committee of Bone and Joint Decade and School Health Committee) (Table 2), was distributed to all students at model schools (1 elementary school and 1 middle school). Completed questionnaires were screened, and subjects for the primary musculoskeletal

Table 3 Results of secondary musculoskeletal examinations

School year	Site	Abnormality found among the items examined	Diagnosis	Prognosis	Presumed cause of injury
Elementary school					
1st	Neck and knees are sometimes painful	—	No abnormality found		
1st	Pain in the right knee (cause unknown)	—	No abnormality found		
1st	Right elbow fracture after-effects (deformity and limited range of movement)	Yes (Range of elbow movement)	Post-bone fracture cubitus varus deformity	Further examination required	External injury
2nd	Pain in both knees (cause unknown)	—	No abnormality found		
4th	Pain in both heels (suspected apophysitis)	—	Calcaneal apophysitis in both heels	Caution required	Sport (Unknown)
4th	Pain in the right shoulder (when pitching), neck pain, bow legs	Yes (Bow legs)	Pitcher's shoulder	Further examination required	Sport (Baseball)
5th	Pain on the inside of the right elbow since the previous day (subcutaneous bleeding present)	—	Suspected osteochondritis dissecans	Caution required	Sport (Baseball)
5th	Pain in the right lateral malleolus	—	No abnormality found		
5th	Heel pain (possibly apophysitis, requires differential diagnosis)	—	Not examined		
5th	Pain on the inner sides of both legs (ostibiale externum suspected)	—	No abnormality found		
6th	Frequent right ankle sprains & pain	—	Not examined		
6th	Cubitus valgus deformity (both elbows), clinodactyly in both pinky fingers, pain in the left knee	—	No abnormality found		
Middle school					
2nd	Preexisting spina bifida; elevated scapula and knee pain identified in medical examination	Yes (Elevated scapula)	Spina bifida	Caution required	Congenital
2nd	Pain in both feet, (balls of the feet), both elbows, and both knees	—	Broad feet, sesamoiditis	Further examination required	Sport (Basketball)
3rd	Continuing low back pain	—	Suspected lumbar spondylolysis	Further examination required	Sport (Unknown)
3rd	Low back pain (when sitting for long time period)	—	No abnormality found		
3rd	Low back pain (cause unknown)	—	No abnormality found		

examination were selected.

Then, orthopedists conducted primary musculoskeletal examinations using the items to examine from the musculoskeletal examination program (preliminary version, prepared by Japanese Committee of Bone and Joint Decade and School Health Committee) at each school. There were four items to inspect: 1) check for walking abnormalities for possible presence of paralysis, muscle degeneration, leg deformations, or leg length discrepancy, 2) have students squat down to check for the mobility of thighs, knees, and legs, 3) have students go through certain movements such as extending the elbows with the palms of both hands facing upward, bending the elbows, and raising the shoulders to check for elbow and shoulder joint mobility, and 4) have students bend forward or stand straight while facing the rear to check for scoliosis. Following

the primary examinations performed by orthopedists, students deemed to require more detailed examination underwent radiography and secondary musculoskeletal examinations at medical institutions.

Results

Results of musculoskeletal examinations in the elementary school

Questionnaires were distributed to 290 students, and responses were received from all of them. After screening by specialists, 44 students (15%) were selected as the subjects for primary musculoskeletal examinations. Then, 12 (4%) were selected as the subjects for secondary examination for they were recommended for more detailed examinations. The results of the secondary examinations found that 4 students (1.4%) had abnormalities and 6 students were normal; 2 students were not

examined (**Table 3**). For 3 of the 4 students diagnosed as having abnormalities, sports activities were presumably the cause.

Results of musculoskeletal examinations in the middle school

Questionnaires were distributed to 63 students, and responses were received from all of them. Fifteen students (24%) underwent primary musculoskeletal examinations, and then 5 (8%) students were selected as the subjects for secondary examinations. The results of the secondary examinations on the 5 students found that 3 (4.8%) had abnormalities while 2 were normal (**Table 3**). For 2 of the 3 students diagnosed as having abnormalities, the cause was thought to have been sports activities.

Summary of musculoskeletal examination results

Musculoskeletal examinations conducted at model schools found musculoskeletal disorders in 1.4% of elementary school students and 4.8% of middle school students. Causes of these disorders were damage by sports activities, after-effects of trauma, and a congenital disease.

Discussion

These musculoskeletal examinations conducted at model schools clearly showed that there are schoolchildren and students with musculoskeletal disorders. Furthermore, results of musculoskeletal examinations in other cities have illustrated a trend towards an increase in the morbidity of musculoskeletal disorders as age increases from elementary school to high school, which is shown in this study as well. This indicates the need for schoolchildren and students to undergo musculoskeletal examinations. The first prerequisite for introducing musculoskeletal examinations into

school is to raise knowledge and understanding among school staff on the issue of musculoskeletal disorders and the significance of conducting examinations. The attitude survey of school staff indicated that understanding of musculoskeletal disorders and preventative measures are currently insufficient. In order to introduce musculoskeletal examinations into school, understanding of school staff will be imperative.

In this study conducted in Fukuoka City, screening for musculoskeletal examinations was performed by orthopedists. But, if screening using a written interview sheet is to be introduced into school health program, we shall require a simple and very precise one to allow any school physicians including those who are not specialized in orthopedics to perform mass screening. In order to enable non-specialists to identify suspected cases of musculoskeletal disorders, all school physicians will have to master additional skills, including examination methods based on the musculoskeletal examination program that was prepared by Japanese Committee of Bone and Joint Decade as the preliminary version. In consideration of the health of all schoolchildren and students, implementing projects commissioned by MEXT is not enough. Establishing a system for diagnosis and early treatment of musculoskeletal disorders as part of regular school health examinations is highly desirable.

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Reference

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