1. Introduction

As early as the 1960s in postwar Japan, there was concern about “the declining physical fitness (PF)” of children. Since then, Japanese schools have endeavored not only to improve children’s PF, but also to measure PF and motor ability (MA). Thus, one of Japan’s advantages is that the degree of success of efforts for PF improvements can be confirmed on the basis of factual evidence. In this way, a constant standard of overall PF and MA has been maintained even in contemporary Japan, where comfortable and convenient lifestyles have been achieved (Noi and Masaki, 2002). This point is arguably a recent success of physical education (PE) in Japanese schools. That being the case, what exactly is the feeling of concern described above regarding “declining PF”? Studies into adults’ “image of the overall physical fitness” of children implemented on the basis of such doubts have indicated that it is “the image of PF for protection” that has the strongest influence on such feelings, rather than “the image of PA for performance” or “the image of MA” (Noi, 2007). Yet the feeling does indeed exist. Thus, we have attempted to carefully collect a wide range of data on the feelings of classroom teachers in the nursery and educational fields. We have confirmed the concerns of classroom teachers in nursery and educational fields. They include the presence of children who say they are tired almost immediately and children who cannot sit still in class (Abe et al., 2011). While such problems are not diseases or disabilities, they are phenomena that cannot, in most cases, be termed healthy. We regard these issues as “physical disorders” and are engaged in substantive investigation and resolution. On the other hand, it is little wonder that problems such as “breakdown in classroom discipline” and “sudden anger outbursts” by students, which have been hot topics in recent years, occur in situations where such children are present. Therefore, it is now necessary to clarify exactly the problem concern and area with children’s bodies. This is research at the “problem discovery stage.” Moreover, research on the “physical disorders” of children by no means ends once a problem is discovered. Naturally, the problem must be resolved. It is thus necessary that we propose hypotheses for solving the problem, put them into practice, and verify whether they actually work. This is research at “the problem-solving stage.” Based on the foregoing discussion, our study group is engaged at each research stage. In this presentation, I would like to introduce our expectations regarding “morning physical activities that children themselves can enjoy independently” and the related practice of such activities in order to solve the “physical disorders” observed among Japanese children.

2. Educational curriculum and the children’s physical and mental health in Japan

The contents of Japanese education are determined by the “Enforcement Regulations for School Education Law.” Figure 1 shows the curriculum outline for Japanese elementary schools. As you can see, it comprises “School Subjects,” “Moral Education,” “Special Activities,” and “Period for Integrated Study.”
This shows my interpretation of the educational curriculum. There is no “order of importance” for school subjects like Japanese language, social studies, physical education, and so on. Therefore, I showed these on a horizontal line. On the other hand, “Moral Education,” “Special Activities,” and “Integrated Study” transcend this outline and involve integrated, comprehensive studies. Thus, I have shown them as depicted.

In other words, “schools” are the sites where this education takes place. This educational curriculum naturally involves consideration of both the physical and mental aspects of school students. This is also evident when looking at individual class time periods. In Japanese elementary schools, each class period is 45 minutes. In junior and senior high schools, each period is 50 minutes, while at universities, class periods are 90 minutes long. These time lengths reflect the physical and mental states of the children.

Meanwhile, we hear many teachers at nursery school and education sites, as well as students’ parents, complain that more students get tired very easily, more students find it hard to sit up straight and more students are unable to sit still in class, and so on. We hear about these and many other examples of anxiety about children’s bodies and minds. Such a situation can in no way be called “healthy.” It also causes concern about possible hindrances to educational activities in schools.

We hypothesized the functional problem of frontal lobe in one background. Thus we are trying to grasp the actual situation.

3. The actual situation of the frontal lobe function in the Japanese children

Our research group used go/no-go tasks to measure frontal lobe functions and classified characteristics of frontal lobe of each child in five types from provided data. From the five types, Figure 2 shows the incidence rate of the “Melancholic Type.”

This type is the most infantile type measureable. It means that there has been insufficient child development, including in the “excitatory process” required for concentration and the “inhibitory process” necessary for controlling one’s feelings. In

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**Figure 1** The curriculum outline for Japanese elementary schools.

**Figure 2** The incidence rate of ‘Melancholic Type.’ (The National Network of Physical and Mental Health in Japanese Children, 2014)
1969 Tokyo, for both boys and girls, as age increased, there was a corresponding decrease in this most infantile type. By the time a child started elementary school, this type was a minority in the classroom, comprising around 20% or 30% of students. At the late 1990s in Tokyo, 30 years after the first survey, for students entering elementary school, this type had increased to around half of all students.

The early 1990s was when people in Japan first started noticing the problem of students walking around the classroom and otherwise disturbing classes. Just looking at this figure, we expected that depending on student composition, there would have been classes where a majority of the children would not have been able to concentrate and pay attention. Surely we can easily imagine that serious problems could occur including “breakdown in classroom discipline” and the so-called “first-grade problem.”

The same survey was also conducted in the latter half of this century’s first decade. We can confirm similar or even higher incidence rates of this type children. We especially observe that boys are having particular difficulties overcoming their infantile behavior.

4. Morning physical activity

As a means of improving this situation, our group focused on “morning physical activities.” I would like to show you some data that provides the basis for our focus.

For our first index of proof, we used bar-gripping reaction time, which is a reflection of arousal level (Iki and Noi, 2014). Figure 3 shows the change rates of bar-gripping reaction values before and after the morning activities were performed before the first class period.

As you can see from this figure, dynamic activities such as “playing tag,” “jogging,” and “playing outside” showed greater before-after change rates for bar-gripping reaction values than did the static activities of “reading” and “studying.” In other words, here we observed a heightening of arousal levels. So, did increased movement lead to higher reaction values? The correlation coefficient between the number of steps made in morning activities and bar-grip reaction times was only able to confirm a significant low negative correlation (r=-.202, p<0.05). Next, we made comparisons of changes in bar-gripping reaction values for the activity among the five each child identified as “most fun” and all of the remaining activities. Then, significant differences were confirmed between the “most fun” activity and the other activities (Most fun activity: -13.8±22.9%, The other activities: -5.6±7.8%). We thus observed that the activity each child found “most fun” led to a higher arousal level.

From these findings, we believe that “physical activity” is needed to raise arousal levels sufficiently to stimulate the activation of frontal lobe functions. We also think that the children’s “independence” is important.

From a different survey, we took the odds ratio for determining a “Melancholic Type” and compared it with quantities of time spent on a variety of daily activities (Shikano et al., 2015.)
In figure 4, students have been divided into two groups on the basis of the quantity of time spent on each of the activities. This figure shows the odds ratio of the “Less time group” in the case when the odds ratio for determining “Melancholic Type” in the “More time group” is taken as “1.” This shows that for those children with an odds ratio of around “1” for a variety of after-school activities and sleep time, it is only the odds ratio for morning physical activity that has a significantly high value. In other words, we confirmed that for those students with morning physical activity of “a small amount of 10 minutes or less” have 1.5 times the risk of being a “Melancholic Type.”

These results show that when morning physical activity is performed, this has a strong impact on frontal lobe functions throughout the morning of the same day. Such stimulated frontal lobe functioning may be possible with as little as 10 minutes of morning physical activity.

5. Conclusion

We would like to suggest is the necessity of implementing “independent morning physical activities that children can enjoy by themselves.” This will not only help resolve contemporary children’s health problems, but will also lead to more effective developments in at-school educational activities.

References


Iki, M. and Noi, S. (2014) The influence of various morning activities on the arousal levels of


