An Empirical Study on the Effect of Physical Exercise and Outdoor Lighting on Pupils’ Eyesight

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Abstract: Objective: To explore the effect of physical exercise and outdoor lighting on the improvement of pupils' eyesight. Methods: A total of 208 first grade students in a primary school in Chengdu were enrolled in the study, 104 of whom were nearsighted and 104 had normal vision. They were randomly divided into indoor exercise group, outdoor exercise group, indoor control group and outdoor control group. Indoor and outdoor exercise groups performed moderate and high-intensity aerobic exercise three times a week, 60 minutes each time; The indoor and outdoor control groups had normal study and life during the experiment, without exercise intervention. The experiment lasted for one academic year, and the visual indicators of the subjects were tested before and after the experiment. Results: After the experiment, the visual fatigue index of the subjects with normal vision in the outdoor exercise group, indoor exercise group and outdoor control group decreased by 1.5 ± 2.89, 1.4 ± 3.05, 2.12 ± 2.66 respectively, and the diopter index decreased by 0.30D ± 0.09, 0.41D ± 0.16, 0.40D ± 0.19 respectively, while the visual fatigue score of the subjects with normal vision in the indoor control group increased by 2.3 ± 2.15, and the diopter decreased by 0.53D ± 0.22. There were significant differences in visual fatigue and diopter among the subjects with normal vision in each group (P<0.001). After the experiment, the visual fatigue index of the myopic subjects in the outdoor exercise group, indoor exercise group and outdoor control group decreased by 1.8 ± 1.95, 0.8 ± 1.81, 1.1 ± 1.85 respectively, and the diopter index decreased by 0.35D ± 0.21, 0.52D ± 0.24, 0.52D ± 0.15 respectively, while the visual fatigue score of the myopic subjects in the indoor control group increased by 1.3 ± 2.66, and the diopter decreased by 0.62D ± 0.29. There were significant differences between groups in visual fatigue and diopter (P<0.001). Conclusion: Both physical exercise and outdoor lighting can have a beneficial effect on children’s vision, and the superposition effect of the two is better. It is suggested that outdoor physical exercise should be carried out more in primary school.

Keywords: physical exercise, outdoor lighting, pupil, vision, myopia

Conference Title: ICSSEPH 2023: International Conference on Sport Science, Exercise and Physical Health
Conference Location: Beijing, China
Conference Dates: April 03-04, 2023