

Effects of "Visual digital training" on improving the performance of young male swimmers

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Visual digital training is a new training method that has been developed in recent years, which is characterized by controlling the exercise intensity through the "following light". Different from traditional training methods, this training method can effectively control the swimming speed by athlete himself to finish training task arranged by the coach during the training process. However, the mechanism of the training method is still under discussion.

The present study is to explore the training effect and possible principles of the training method by comparing training outcomes of four outstanding male adolescent swimmers so as to provide theoretical and practical basis of the training method.

Methods and materials

1. Participants

Four national elite level-one male swimmers (15.5 ± 1.3 years, 184.2 ± 8.3 cm, 74.8 ± 4.1 kg, training period 8 ± 0.8 years) from Wuxi amateur swimming school were participated in this study.

2. experimental instruments

The swimmer training instruments are a MultiSports Trainer -128 (Patent No.: 201210394388.9) and a Light Guide Trainer (Patent No.: 201621118007.4), provided and manufactured by Beijing ReadyGo TechnologyLtd.Co. The swimming performance and techniques indexes were tested before and after using the instruments.

3. experimental protocol

The experiment was divided into two 8-week stages. In the first stage, "Visual digital training" was carried out, and athletes were trained three training sessions/week with the experimental training instruments. And the exercise training protocol in the second stage was the same as the first stage, but the experimental instruments were not used. At the beginning and end of the two stages, the athletes were tested. And the performance and techniques were recorded and analyzed using SPSS software.

Findings and Discussions

the swimming speed was increased by $2.58 \pm 0.82\%$ ($P < 0.01$) after the first stage of training, while the speed decreased by $3.53 \pm 0.56\%$ ($P < 0.01$) at the end of the second stage, In addition, the segmented timing of swimming is also improved in the first training stage. the segmented timing was increased by $2.94 \pm 2.57\%$ ($P < 0.05$) after using the instrument, in contrast, it was decreased by $3.93 \pm 3.74\%$ ($P < 0.05$) when the instrument was not used; the swimming performance of other segment

timing was increased by $3.27 \pm 1.57\%$ with using the instrument, however, the swimming performance decreased by $5.36 \pm 2.45\%$ ($P < 0.01$) when the instrument was not used, the results indicated that "Visual digital training" promote the swimming speed.

The average stroke length of the four athletes was evaluated that showed no significantly change when compared with stroke length before and after using the instrument ($1.65 \pm 0.48\%$ VS. $1.62 \pm 0.46\%$, $P > 0.05$), and the stroke rate was also not showed significant change before and after using the instrument ($1.12 \pm 0.26\%$ VS. $1.10 \pm 0.25\%$, $P > 0.05$), which suggested that the use of the instrument had no obvious effect on the stroke rate and stroke length.

Conclusions

"Visual digital training" has significant positive effect on athletes 'performance that showed improvement of performance and segmented performance but has less effect on the stroke length and stroke rate. Meanwhile, it seems hard to maintain the training effect after stopping using the instrument. It is still necessary to investigate how to keep the training effect of using the instrument and underlying mechanism of the training method.

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