

# 小学校水泳授業における保温水着着用の基準設定 —環境条件および身体特性を考慮して—

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## Evaluation of Standard Condition for Wearing Thermal Swimsuit during Elementary School Swimming Class -Multiple Effects of Environmental and Physical Characteristics-

by

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### ABSTRACT

In this study, we have investigated the multiple effects of the environmental condition, physical characteristics, and swimwear condition on children's thermal sensation (*TS*) during elementary school swimming class, and evaluated the standard condition for wearing thermal swimsuit. Sixth-grade elementary school children ( $n=68$ ) participated in

a swimming class 8 times. Multiple regression analysis was performed to make estimation equation of  $TS$ . The following two regression equations were developed. The equations contain 3 predictors of water temperature ( $Tw$ ), swimwear condition ( $Suit$ ), and physical characteristics (surface area per body weight:  $SA/BW$  or  $BMI$ ). ( $TS = 0.58Tw + 1.21Suit - 126.2SA/BW - 11.3$ ,  $TS = 0.58Tw + 1.21Suit + 0.139BMI - 17.8$ ). The thermally comfortable area was indicated by the estimated equations. Based on these equations, we suggested functional equations expressed by  $Tw$  and physical characteristics for wearing thermal swimsuit ( $Tw = 217.3SA/BW + 18.6$ ,  $Tw = -0.24BMI + 29.9$ ).

## 要 旨

本研究は、小学校水泳授業における児童の温冷感を、環境条件・身体特性・水着条件の複合的な影響を考慮して評価し、温冷感に基づく保温水着着用の基準条件を示すことを目的とした。小学校高学年児童 68 名を対象に 8 回の水泳授業を行い、温冷感 ( $TS$ ) を従属変数とし、環境条件、身体特性、水着条件の 3 要因を独立変数として重回帰分析を行った。その結果、水温 ( $Tw$ )、水着条件 ( $Suit$ ) および身体特性 (体表面積/体重:  $SA/BW$  または  $BMI$ ) を説明変数とする 2 つの重回帰式 (温冷感予測式) が得られた ( $TS = 0.58Tw + 1.21Suit - 126.2SA/BW - 11.3$ ,  $TS = 0.58Tw + 1.21Suit + 0.139BMI - 17.8$ )。温冷感予測式を基に水泳授業時の温熱的快適範囲を示した。また、保温水着着用基準として身体特性と水温の関係式を示した ( $Tw = 217.3SA/BW + 18.6$ ,  $Tw = -0.24BMI + 29.9$ )。