12-1 The chronic effects of bathtub bathing, whole body warming, and herbal extracts on the mental conditions of healthy young persons

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Objective: The purpose of this study was to clarify the chronic effects of bathtub bathing (BB), whole body warming after bathtub bathing (BBW), and bathtub bathing with herbal extracts (BBH) on the mental condition of healthy young persons.

Subjects and Methods:
Experiment 1: Eighteen (6 male and 12 female; age: 19.6±0.7 years, mean ± SD) healthy young persons who were taking a shower habitually but not bathtub bathing participated in this study.

From November 2012 to December 2012, subjects were randomly assigned into two groups (each 3 male, 6 female): those who had BB or 30-min BBW 14 times for 14 consecutive nights during a 2-week period. After a 2-week washout period, subjects were asked to switch their bathing conditions (a cross-over design).

Experiment 2: Twenty (8 male and 12 female; age: 21.3±1.6 years, mean ± SD) healthy young persons who were taking a shower habitually but not bathtub bathing participated in this study.

From October 2013 to November 2013, subjects (4 male and 6 female) were randomly assigned to undergo BB or BBH.

The herbal extract contained Dong dang gui (Japanese Angelica Root), Chimpi (Citrus Unshiu peel), Chamomilla recutita, and ginger extracts.

After a 2-week washout period, subjects were asked to switch to the other bathing condition (a cross-over design).

All participants provided informed consent for participation in these studies, and these studies were approved by the Ethics Committee of the Kumamoto Health Science University.

The subjects immersed their bodies up to the supraclavians for 10 min, in tap water adjusted to a temperature of 41 °C in their bathtub at home.

The subjects’ mental conditions were assessed using Profile of Mood States short version questionnaire.

The differences in the effect of BB and BBW, as well as those of BB and BBH on the subjects’ mental conditions and their mental conditions pre-BB and post-BB, pre-BBW and post-BBW, pre-BBH and post-BBH were analyzed using Wilcoxon’s signed-rank sum test.
**Results:** The points for depression-dejection, fatigue, and confusion in those who had BBH significantly converged to the median average (50 points) compared to the points in those who had BB.

The points for anger-hostility before BBW and BBH significantly converged to the median average (50 points) after BBW and BBH, and there were no significant differences in points before and after BB.

**Conclusions:** The subjects’ anger-hostility was influenced by body warming in BBW and the vasodilatory components of the herbal extracts.

The subjects’ depression-dejection and fatigue was influenced by the fragrance and color of herbal extracts.

**Keywords:** Bathtub bathing, Whole body warming, Herbal extracts, Mental conditions, Healthy young persons