Determination of Optimum Number of Groups on Japanese participants recruited from Crowdsourcing Interpreted by Physical Constitution Defined by CCMQ-J Mariko SATO1,2, Toshihiro KAWASAKI2 , Ming HUAN

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Background: Chinese Medicine Questionnaire (CCMQ-J) consists of 60 independent questionnaires and can determine nine physical constitutions called subscales. One type is balanced constitution (i.e., gentleness), and the following eight types represent unbalanced constitutions: Qideficiency constitution, Yang-deficiency constitution, Yin-deficiency constitution, Phlegm-dampness constitution, Damp-heat constitution, Stagnant Blood constitution, Stagnant Qi constitution, and Inherited Special constitution. CCMQ-J has been used for the development of functional food and gained further understanding of the health of local communities. Since CCMQ-J was developed initially in China, we considered the application of CCMQ-J in Japan. The purpose of this study is to determine the optimal number of Japanese subscales and to understand their characteristics.

Methods and Results: In this study, we proposed to determine the optimal number of groups in 851 Japanese participants recruited from crowdsourcing using CCMQ-J questionnaire consisting of 60 questions. We applied k-means clustering with the gap statistics as well as the hierarchical clustering to the data. I found that the number of optimal groups was five. The five groups are mainly characterized by three subscales in CCMQ-J, i.e. (i) gentleness, (ii) three subscales corresponding to gentleness, Yangdeficiency and Qi-depress (iii) two subscales corresponding to Yang-deficiency and Qi-depress (iv) Yang-deficiency, and (v) Qi-depress. In the crowdsourcing survey, two subscales, Yangdeficient and Qi-depress were found to be the most frequently occurred in people in Japan.

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