SUMMARY OF MASTER'S DISSERTATION

Student Identification Number	81333344	Name	Nahomi SEI

Title

Analytical Modeling on Medical Examination Data for Effective Health Consultation to Prevent Metabolic Syndrome

The prevention of lifestyle diseases such as metabolic syndrome (MS) has been taken into consideration evenlimitations in the social security budget and community-based interventions for the maintenance of the quality of life. The Ministry of Health, Labour and Welfare started specific health consultations for high-risk patients through the specific medical checkup in 2008. However, facilitating changes in long-term lifestyle habits is considered difficult. It is believed that the MS risk depends on different lifestyles and patients' demographics. Therefore, data on medical examination were collected on sex, age, and personnel transfers in specific workplaces for the past 5 years by using the standard questionnaire for medical checkup by the Ministry of Health, Labour and Welfare. The author statistically analyzed factors developing MS and examined what factors should be improved to prevent high-risk patients or recover from MS.

Participants were divided into five groups according to the change in the status of MS progress over 5 years. Those who did not develop MS over 5 years are called the "Non-MS group," those who developed MS but did not have MS at the end of 5 years the "Escape group," the people who developed MS "the new face group," those who did not have MS at first but developed MS before the end of 5 years the "Rebound group," and those who had MS and continued to have MS were the "MS continue group." The statistical analysis showed the following findings:1. A rapid meal speed likely prevent the MS. Exercise during 5 years likely to contribute to escape from the MS.

The results with a Bayesian network (BN) shows that high-risk patients should improve their lifestyle to prevent MS development. In BN, the hierarchical structure of blood pressure, girth of the abdomen, blood sugar levels, and blood adipose inspection node directly constitutes MS, and lifestyle nodes affects inspection nodes such as dietary habits and exercise habits. These were irrelevant to the health node. A model that shows the influence of changes in lifestyle on the status of MS is developed for a clinician to consult a target patient with the concrete health steps that will be needed to improve health in the future . The probability that blood sugar level worsens over the next year is likely elevated in the person with the above-mentioned breakfast undernourishment habit three times a week. The probability that acyl glycerol and the degree of corpulence improved over the next year is higher if the walking speed was rapidly increased. Lifestyle improvement may become easier for a patient. We have used the results of this study for health instruction and can confirm a positive effect in lifestyle improvement in patients. The author plan to develop a more precise model in the future.

Key Word(5 words)

Metabolic syndrome, Statistical analysis, Bayesian network, Lifestyle diseases, Health consultation