## 5. Effect of diabetes and prediabetes on the development of disability and mortality among middle-aged Japanese adults: A 22-year follow up of NIPPON DATA90

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Aims/introduction: Diabetes and its complications could lead to severe damage to the heart, eyes, kidneys and nervous system, which diminishes the patient's quality of life. Disability, defined as a decline in activities of daily living (ADL), is considered as a long-term effect of diabetes on general health. The association of prediabetes with disability and death without disability among middle-aged adults remains uncertain. If prediabetes among middle-aged adults is associated with future risk of disability and mortality, the findings would support the evidence to recommend early lifestyle modification in the prediabetes stage, which might be easier to control than in diabetes. We carried out a longitudinal analysis to examine the association between diabetes and prediabetes at baseline, and disability, mortality over a 22-year period among middle-aged Japanese adults.

Materials and methods: The National Integrated Project for Prospective Observation of Non-communicable Disease and its Trends in the Aged 1990 (NIPPON DATA90) was a cohort study. The baseline survey was carried out in 1990 as the National Survey on Circulatory Disorders. A total of 8,383 community residents (3,503 men, 4,880 women; aged ≥30 years) from 300 randomly selected areas participated in the survey, with a participation rate of 76.5% (8,383 of 10,956). In the present study, we excluded those who met the following criteria: 4,690 participants who were aged <45 years and aged ≥65 years in 1990 (i.e., baseline), 47 participants who had a history of stroke in 1990, 272 participants with missing baseline data, and 1,586 participants who were lost to follow up or had no record of living status nor any activities of daily living (ADL) investigation in the 22-year follow up.

We used the Tokyo Metropolitan Institute of Gerontology (TMIG) Index of Competence, a widely used scale for measuring ADL and IADL with demonstrated reliability and validity. In the pooled survey, over a 22-year follow up, participants aged ≥65 years who had reached age 65 years at four time points (1995, 2000, 2006, 2012) were eligible for the ADL survey. The ADL survey were carried out by face-to-face interviews at home, telephone interviews, a questionnaire sent by mail or other methods.

Results: In the present study, 334 participants (18.7%) reported at least one disability, and 350 (19.6%) were reported dead without observation of disability during follow up. Adjusting sex and other risk factors, participants with diabetes and prediabetes had a higher risk for disability (OR 1.43, 95% confidence interval [CI] 1.07-1.91 and OR 1.66, 95% CI 1.10-2.50, respectively) and for mortality (OR 1.56, 95% CI 1.16-2.08 and OR 1.77, 95% CI 1.18-2.65, respectively) than individuals with normal glucose tolerance.

Conclusions: In middle-aged Japanese adults, individuals with diabetes and prediabetes were more likely to be associated with disability and mortality. Our findings suggest that prediabetes and diabetes in middle-aged adults should be paid more attention, and requires more intervention to prevent disability and mortality in later life.

Keywords: Disability; Mortality; Prediabetes.

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