Physical activity in later life in atomic bomb survivors of Hiroshima and Nagasaki

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Background : The Life Span Study (LSS) of atomic bomb survivors is an important resource for elucidating the contribution of lifestyle factors in relation to the long-term health outcomes of radiation exposure. Although physical activity is a well-known risk factor for chronic diseases, reports on the distribution of physical activity in the LSS cohort are limited. Therefore, we aimed to clarify the distribution of physical activity levels in the LSS cohort using data collected in a mail survey.

Methods : Data on physical activity were collected using a self-administered mail survey conducted between 2008 and 2011. Participation in leisure-time exercise habits by intensity and physical activity by domain were assessed. We used modified Poisson regression models to examine differences in the prevalence of exercise habit and physical activity between weighted colon dose categories (cut-points: 0.005, 0.10, 0.20, 0.50, and 1.0 Gy).

Results : The mean age at the time of response was 75 years, and women accounted for 60% of the responders. Approximately 60% of the members had exercise habits regardless of intensity. Overall, prevalence of exercise habits and physical activity in all domains tended to decline with age. Those with higher radiation exposure were less likely to engage in light-intensity exercise habits. Regarding physical activity, those with higher radiation exposure were less likely to have walking and standing activities. No significant associations were found between radiation dose and moderate- and vigorous exercise, heavy labor, and bicycling.

Conclusion : This study clarified the physical activity status of atomic bomb survivors in Hiroshima and Nagasaki. We found a dose-dependent decrease in light-intensity activities. Our findings may be beneficial for developing health promotion strategies for atomic bomb survivors in later life. Furthermore, this study suggests the need to consider information on physical activity in radiation epidemiology.

Association between temperature and all-cause hospitalization by functional status in Tokyo, Japan

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Background : Although previous research has shown that vulnerable populations—such as older adults and children—are at greater risk from climate change, few studies have examined the risks among individuals with varying functional statuses. This study aimed to investigate the association between ambient temperature and all-cause hospitalization by functional capacity.

Methods : We obtained daily hospitalization data from the Diagnosis Procedure Combination database and the weather data from the Japan Meteorological Agency for Tokyo from 2012 to 2019. Using a time-stratified case-crossover design, we applied a conditional quasi-Poisson regression incorporated with a distributed lag non-linear model to assess the association between ambient temperature and all-cause hospitalization. Analyses were stratified by functional status at admission, determined using the Barthel Index with a score of 60 as the cut-off.

Results : A total of 1,776,899 all-cause hospital admissions were included in the study. For functionally independent individuals, the relative risk (RR) was 0.98 (95% confidence interval (CI): 0.91, 1.05) at extreme cold (5th percentile) and 1.01 (95% CI: 0.97, 1.04) at extreme heat (95th percentile), compared to the minimum hospitalization temperature. Among functionally dependent individuals, the RR at extreme cold was 1.15 (95% CI: 1.09, 1.22), with an elevation at extreme heat (RR: 1.05 (95% CI: 1.02, 1.08)). Heat-related risks increased in both groups, but cold-related risk was observed only for functionally dependent persons.

Conclusion : Temperature-related risks of all-cause hospitalization differed by functional status. We found weak evidence of extreme cold effects among the functionally independent individuals. The functionally dependent individuals are impacted by both heat and cold, highlighting the importance of functional status in assessments of health disparities and improving public health interventions and climate adaptation policies.

Rhinitis symptoms and income-related differences by ambient and indoor air pollution exposure

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Introduction : Previous studies on the associations between exposure to various indoor air pollutants, as well as co-exposure to ambient and indoor air pollutants, and rhinitis are limited.

Method : Data from the Korea National Health and Nutrition Examination Survey (2020-2021) were analyzed (n = 1,812). Ambient air pollutant concentrations were estimated using the Community Multiscale Air Quality Model, while indoor air pollutant concentrations were measured in each household. Associations with the presence of rhinitis symptoms in the past 12 months (PRS) were examined using logistic regression models for individual ambient and indoor air pollutants, as well as for a composite exposure variable that combined ambient fine particulate matter ($PM_{2.5}$) and indoor total volatile organic compounds (TVOC) concentrations (*low-low*, *low-high*, *high-low*, and *high-high*). Stratified analyses by household income were conducted using the same models.

Result : A doubling of ambient $PM_{2.5}$ concentrations over one year was associated with higher odds of PRS [odds ratio (OR) = 2.68, 95% confidence interval (CI): 1.45, 4.78]. A doubling of TVOC (OR = 1.08, 95% CI: 1.01, 1.16) and toluene (OR = 1.10, 95% CI: 1.02, 1.20) concentrations were associated with higher odds of PRS. Compared to the *low-low* group, other composite exposure groups had increased odds of PRS. These associations were more pronounced among individuals with lower income than among those with higher income.

Conclusion : Ambient and indoor air pollution exposures were both individually and collectively associated with higher risk of PRS among adults. Since this study used a cross-sectional design, further longitudinal studies are needed

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Prediction of the Psychological State of Bereaved Families with Patients in Palliative Care

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IntroductionSadness is a natural emotion following bereavement, and while it often subsides over time, some suffer from depression or complicated grief (CG). Depression is seen in approximately 25-45% of bereaved individuals, and as it progresses, it increases the risk of suicide. CG is seen in approximately 7-20% of bereaved individuals and can lead to difficulties in reintegrating into society and risk of substance abuse and suicide. Early intervention is important, so this study aimed to build a predictive model using machine learning to identify individuals in need of intervention.MethodsUsing data from the "ComeHome Bereaved Family Survey," we predicted scores on the Patient Health Questionnaire (PHQ)-9, a depression assessment scale; the Brief Grief Questionnaire (BGQ), a scale for assessing CG; and the Grief and Depression Inventory (GDI), a scale measuring the achievement of a "good death," and explored factors associated with the scores. For prediction, we used filter-based regression, stepwise regression, LASSO regression, and random forests.ResultsFilter-based regression showed the best predictive accuracy for the PHQ, stepwise regression for the BGQ, and regression for the GDI. Overall, regression predictions had moderate or higher correlations ($r > .5$) with all predictors. In the filter-based regression model, the related factors for the PHQ were seven items, including the bereaved family's health status; for the BGQ, three items, including the bereaved family's psychological preparation; and for the GDI, 10 items, including the CES, a measure of quality of care.DiscussionThe related factors for the PHQ, BGQ, and GDI differ in their characteristics, and interventions that take each factor into account are important. Based on the related factors for the PHQ and BGQ, improving family relationships during hospitalization may prevent depression and CG. Hospital selection may be important for improving the GDI.

Association between socioeconomic status and prevalence of dysphagia in Japan

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Background : There is limited evidence regarding the association between socioeconomic status (SES) and dysphagia. This cross-sectional study investigated the association between SES and dysphagia among community-dwelling Japanese adults aged 20 to 95 years.

Methods : Study participants were 9148 (3979 men and 5169 women). Household income was categorized into three groups: less than 3 million yen, 3 to less than 5 million yen, and 5 million yen or more per year. Educational attainment was categorized into three groups: junior high school, high school, and vocational school, junior college, or higher. Dysphagia was assessed using the self-administered 10-item Eating Assessment Tool (EAT-10) questionnaire. A score of 3 or higher was used as the cutoff point, based on the validated Japanese version. Adjustments were made for age, smoking status, alcohol consumption, weight change, living alone, changes in eating habits, independence in daily living, number of medications, leisure-time physical activity, body mass index, hypertension, dyslipidemia, diabetes mellitus and self-reported bilateral posterior occlusal support.

Results : The prevalence of dysphagia was 11.4% (n = 1039). Higher household income and educational attainment were associated with lower prevalence of dysphagia. Adjusted odds ratios (ORs) (95% confidence intervals [CIs]) for household income of 3 to <5 million yen and ≥5 million yen, compared with <3 million yen, were 0.79 (0.66–0.94) and 0.77 (0.64–0.93), respectively (p for trend = 0.008). For education, adjusted ORs (95% CIs) compared with junior high school were 0.72 (0.57–0.91) for high school, and 0.61 (0.48–0.78) for vocational school, junior college, or higher (p for trend < 0.0001).

Conclusions : Our findings suggest that higher household income and educational attainment may be associated with a lower prevalence of dysphagia in Japan.