

**Results** After adjusting for age, smoking, alcohol use, BMI, physical exercise and chronic diseases, women engaged in shift work without night shifts in midlife had on average a 24% (due to shift work insomnia) and a 16% (due to shift work fatigue) higher risk for a unit increase in ML in old age than those without shiftwork insomnia and fatigue. Likewise, men engaged in shift work with night shifts in midlife had on average a 61% (insomnia) and a 66% (fatigue) higher risk for a unit increase in ML in old age. Furthermore, women in shift work with night shifts and men in shift work without night shifts had on average a higher risk of ML, but the risk was attenuated and remained insignificant after adjustment.

**Conclusions** The findings of this prospective 28 year cohort study suggest that shift work related insomnia and fatigue in midlife have inverse effects on mobility functions in old age irrespective of gender and type of shift work, and indicates in the initiation of prevention of mobility decline in working life.

#### 458 EPIDEMIOLOGICAL STUDY BETWEEN TYPE 2 DIABETES AND BONE MINERAL DENSITY

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**Introduction** In Japan, many people over 65 years old are working now. However, elderly working people frequently face to getting lifestyle diseases, so it would be important to control lifestyle diseases. Among lifestyle diseases, diabetes mellitus (DM) is a popular in the world. On the other hand, Osteoporosis is also an important disease for elderly workers, because osteoporosis is a risk to get fracture. There are some reports indicated that fractures was frequently in workers with DM. However, it was also reported that bone mineral density (BMD) in type 2 DM patients was higher than non-diabetic persons. These reports were contradictory. Therefore, we planned to evaluate fracture risk and BMD of persons with type 2 DM comparing with healthy subjects.

**Material and method** We recruited 183 persons with type 2 DM (detail: 101 males, 82 females) under informed consent. We excluded persons with type 1 diabetes, rheumatic diseases. We collected individual data (age, sex, BMI, fasting blood sugar, average fasting blood sugar, HbA1c value, post history of fracture) and measure BMD using ultrasonic bone mass measurement.

#### Result

- BMD decreased with age. And BMD was higher than healthy subjects (Male and Female).
- In male, there was a significant positive correlation between MBD and BMI.
- In female, a significant positive correlation was found between BMD and fasting blood sugar.
- We didn't detect the difference concerning to fracture history between persons with DM and healthy persons.

**Discussion** We indicated BMD of DM persons was higher than healthy subjects. In addition, BMD of female was a significant positive correlation with the fasting blood sugar. But we could not indicate higher fracture risk in DM persons. We are planning to check whether fracture frequently happened or not in persons with DM.

804

#### THE DETERIORATION TENDENCY OF HEALTH CONDITION IN AGE GROUP AND SEX BY FOLLOW-UP DATA

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**Introduction** Along with the ageing society as a whole, the upper limit of the employment period in law has reached the age of 65 in Japan. It is thought that health risk increases in the elderly. In Japan, the age group subject to focused health promotion activities is considered to be in the 40 s and over. However, from the viewpoint of primary prevention, it is considered that measures to prevent disease are necessary before deterioration of health. Therefore, in order to obtain evidence on the deterioration of health condition, we have observed worker's health examination data over time.

**Methods** Health examination data for 14 years (2002–2015) were analysed. Within this period, the rate at which abnormal values appeared in blood pressure, GOT, total cholesterol, triglyceride, fasting blood glucose was calculated. The sample size is n=25 146 who did not have missing values in all data.

**Results** At the time of baseline (in 2002), abnormal values were found in the examined items, 55% for males and 36% for females. In 2015, they were 69% (14% increase) and 57% (21% increase), respectively. By age group and gender, increase rate for male increased by 16% (38% to 54%) in their 20 s, 17% increase (51% to 68%) in their 30 s, 9% increase in their 40 s (67% to 76%) and increased by 8% (72% to 80%) in their 50 s. For female, these rate increased by 4% (33% to 37%), 19% (33% to 52%), 32% (40% to 72%) and 11% (65% to 76%), respectively.

**Conclusion** With age, the appearance rate of abnormal values in major medical examination items increases. The tendency of the rate of increase varies depending on age group and. The rate of increase in male in their 20 s and 30 s is large, while in females the rate in their 40 s is large. From the viewpoint of disease prevention, it is necessary to develop health education to improve self-management ability and to review lifestyle habits from the stage before deterioration of health condition.

1482

#### OCCUPATIONAL SOCIAL CLASS AND SELF RATED HEALTH. A CROSS SECTIONAL STUDY OF OLDER IRISH ADULTS FROM THE IRISH LONGITUDINAL STUDY ON AGEING

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**Introduction** Self-rated health has been shown to be an important predictor of future morbidity and mortality. We investigated the association between self-rated health and occupational social class in a population at work aged  $\geq 50$  years in Ireland, and determined its relationship with demographic and health-related variables.

**Methods** Cross-sectional data from The Irish Longitudinal Study on Ageing (TILDA), a population-based study of 8175 people aged  $\geq 50$  years was analysed. Those in employment were grouped according to the occupational social classification, an internationally recognised categorisation widely used to analyse social and health variations. Statistical analyses were performed using SPSS (V22.0, SPSS Inc, IL). Tests for main effects were conducted using an ordinal logistic regression using a generalised linear model. The relationship between self-rated health and social class was examined with age, gender, educational status, medical history and multiple lifestyle factors (body mass index (BMI), smoking, alcohol consumption, physical activity) as the independent variables.

**Results** 30% (2440/8175) of the TILDA cohort were in employment at the time of the study and therefore included in the analysis. There was a statistically significant association between self-rated health and occupational social class after adjusting for independent variables as described above (p-value 0.014).

**Conclusion** There is a strong cross-sectional association between self-rated health and occupational social class in those at work over 50 years of age in Ireland. This association is preserved after adjusting for gender, age, past medical history, lifestyle behaviours and educational status. Further research is required to establish if this association persists among retirees. This study confirms the need to tailor health promotion and well-being programs to the different occupational social groups to maximise potential health benefits and to preserve employment among older workers

### 1328 ATTITUDES TOWARD WORKING CONDITIONS: ARE EUROPEAN UNION WORKERS SATISFIED WITH THEIR WORKING HOURS AND WORK-LIFE BALANCE?

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**Introduction** Neoliberal economic globalisation has changed the definition of standard employment and this could be affecting work-life balance. The objective of this study is to describe the satisfaction with working hours and satisfaction with work-life balance and their association in the European Union (EU-28).

**Methods** This is a cross-sectional study based on data from the Flash Eurobarometer 398 among workers of the EU-28 from 2014 (n=13,683). We calculated percentages and their 95% confidence intervals (95% CI). We also fit a multi-level generalised linear model (GLM) using the Poisson family, in order to calculate the adjusted prevalence ratios (aPR) of satisfaction with work-life balance based on working hours. All analyses were stratified for individual, employment and welfare regime country classification.

**Results** Satisfaction with working hours and work-life balance was 80.62% and 74.48%, respectively, and was significantly higher among women. The highest percentages of satisfaction were found in Nordic welfare regime countries (90.2% and 85.3%, respectively). There was a statistically significant association between satisfaction with working hours and work-life balance (aPR=2.63, 95% CI: 2.28 to 3.04), and the magnitude of the association differed by individual and employment characteristics and welfare regime country classification. The

main reasons declared for dissatisfaction were 'excessive working hours' (48.7%), 'shift work' (27.9%), and 'inability to influence the work schedule' (28.3%). Differences were observed according to sex and type of welfare regime.

**Conclusion** European Union workers are highly satisfied with their working hours and work-life balance, and there is a strong association between satisfaction with work-life balance and working hours. There are still differences between sexes and welfare regimes. The Nordic model of social policies should be considered to improve satisfaction with work-life balance in the rest of the EU-28.

### 247 THE EFFECTS OF OCCUPATION ON THE EVOLUTION OF BMI IN A BELGIAN EMPLOYEE POPULATION

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**Introduction** During medical investigation, occupational health physicians collect huge amounts of scattered data about their patients. Recently, these data have been integrated into a single data warehouse. In the current study, this data warehouse has been addressed to study the evolution of BMI, and investigate how this trend is effected by the occupation of the employee, controlled for gender and age.

**Methods** Around 78 000 employees were followed-up from 1993 onwards, with following variables: BMI, age, sex, and isco encoded occupation. Multilevel analyses was performed to study the evolution of BMI, with time and time<sup>2</sup> as time-varying variable, and sex, age at start of measurement and occupation as time-independent variables. Including time<sup>2</sup> allows for modelling curvilinear trends over time. Random effects were allowed for the intercept and time-varying variables.

**Result** Over the 23 years of follow-up, we observed a high drop-out of around 90%. Nonetheless, all occupations were still represented at the last measurement. 52.8% was male, mean age was 34.34 years (SD=9.43) at the start of the study. Analyses showed that BMI increases curvilinear with age: the younger, the steeper the curve; Males have higher BMI than females. Occupation also has an effect: Highest BMI was observed with Service personnel of machinery and installations assemblers; the increase of BMI was highest for Leading functions. Random effects showed large inter-individual differences in BMI at starting point and on effect of time.

**Discussion** We've illustrated how the data warehouse can be accessed to answer substantive research questions. Differences in evolution of BMI seems to be related to occupation. The strong curvilinear effect probably indicates healthy worker effect. The high dropout might be explained by employees changing companies, companies changing external service, and/or the reach of retirement age.

### 253 THE ASSOCIATION OF AGE AND CHRONOTYPE IN DAY AND ROTATING SHIFT WORKERS OF A LARGE GERMAN CHEMICAL COMPANY

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