PART-TIME JOBS AND HEALTH COMPLAINTS

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ABSTRACT: *Prior research has demonstrated a significant relationship between part-time employment and well-being, although this relationship is not clear-cut or constant. This study looks at relationships between a specific kind of work and health outcomes. Studying this relationship requires a theoretical and methodological foundation grounded in trustworthy sources. We analyse data from the European Working Conditions Survey (1991–2015), focusing on 5,646 Finnish respondents. We use binary logistic regression with a Binomial response and a logit link function. We conclude that extended work hours, overtime, and part-time employment are linked to a higher risk of worse health outcomes. Age plays a major role in this relationship. The reason why health outcomes worsen despite medical interventions is hypothesised to be working during sick leave. Numerous additional studies worldwide have confirmed the significance of our findings, showing that part-time work can harm people's health and well-being.*

KEYWORDS: *part-time employment, health outcomes, well-being, sick leave, family commitments, Finland*

INTRODUCTION

Over the past few decades, organisations have undergone significant transformation. Non-standard employment arrangements such as contract, part-time, and short-term work have become commonplace in the modern organisation. These significant organisational changes have also affected workers' health and wellbeing. 'Mechanism studies' that have monitored

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workplace organisational changes and their effects on health and safety, the motivating potential of contemporary work practices, and marginalisation of workers, have been widely conducted throughout the world (Kompier 2006; Moriya et al. 2016).

Branine (1999) examined the utilisation of part-time employment in the health services of Denmark, France, and the United Kingdom. In particular, it was shown that while part-time employment is the most prevalent flexible working style in the health services of all three nations, the reasons behind its adoption vary. Those in charge of the National Health Service (NHS) in the UK appear to have found that part-time employment fulfils their need for flexible work schedules and cost savings. While part-time employment in Denmark was a reaction to growing employee demand for flexible work schedules, it was intended to create jobs in the French health service. Furthermore, it has been found that the full-time work customs and the male-dominated culture of the health services in the UK and France have often downplayed the benefits and importance of part-time work. In Denmark, on the other hand, part-time work fits in nicely with the country's longstanding traditions of flexible work schedules and job equality.

Studies have used the term 'employment quality' as a novel way to quantify the risks to occupational health and safety associated with employment (Vanroelen 2019). According to a study by Alamgir et al. (2008), full-time registered nurses were far more likely than part-time and casual employees to be injured. Thus, prior research has demonstrated a significant relationship between part-time employment and well-being, although this relationship is not clear-cut or constant. A theoretical and methodological exploration of the phenomenon, using reliable techniques, is necessary to understand the complex dependencies in evolving work life. To model structural and individual aspects, research needs to go to a new level.

The purpose of this study is to examine relationships between certain types of jobs and health outcomes. First, we enquire into the impact of part-time jobs and working hours on employees' health. Second, we investigate the impact of age and gender on the relationship between particular types of work and health outcomes. Third, we consider the impact of sick leave on health outcomes. Lastly, we investigate the impact of employees' familial circumstances on their health.

THEORETICAL BACKGROUND

Theories and hypotheses

Theoretically, this study draws on two strong research traditions: conservation of resources theory and preference theory. The main theoretical framework is conservation of resources (COR) theory developed by Stevan E. Hobfoll in 1989, which aims to explain the behaviour of individuals in situations where resources are scarce, and they can only partially influence the outcome. Hobfoll (1989) views an individual's resources as values, goals, situations, and circumstances and assumes that a loss or change of resources in some of these areas causes stress in the individual. In order to adapt, individuals use their existing resources when performing work tasks, but they can also supplement and vary their resources to perform tasks and avoid excessive stress. This study applies Hobfoll's conservation of resources theory to assess situations in which individuals seek to adapt to changes in work and family life (Halbesleben et al. 2009; Grandey–Cropanzano 1999). The theory also provides a good starting point for assessing work engagement and the impact of workplace structural factors on it.

Alongside the aforementioned conservation of resources theory, the study applies Katrim Hakim's preference theory (Hakim 2000) and, above all, her argument about the differentiation of forms of work participation. Hakim argued that in modern societies, almost all women have the opportunity to make choices between family work and market-based work. Women make their choices according to the lifestyle they see as their primary model. This can be work-oriented, home-oriented, or a lifestyle that combines paid work and family time.

According to Hakim's theory, lifestyle preferences dictate what individuals consider a 'prime resource'. For work-centred individuals, part-time work may represent a loss of status and developmental resources (resource depletion). Conversely, for home-centred or adaptive individuals, transitioning to part-time work is a strategic decision to prevent the depletion of personal and family-related resources and may involve willingly trading off financial resources for time resources. In line with the resource depletion hypothesis, we assume that the shift to part-time work occurs due to increased workload, as well as employees using part-time work to adapt to changes in their work.

Although we are aware of the criticisms of Hakim's research (Kangas–Rostgaard 2007), we still find it useful to apply preference theory to certain areas when explaining differences in working patterns. When facing health-

related resource depletion, a worker's choice to engage in presenteeism is heavily influenced by their preference type. Work-centred individuals are more likely to invest their remaining energy into work to protect their professional resource pool (reputation, career progression), despite the physiological cost. Home-centred individuals might only work through illness due to severe threats to financial stability (coercive resource loss spiral). In line with the preference hypothesis, we assume that part-time work is associated with poorer self-reported health. Part-time work supports the employee's perceived health and work-life balance.

Part-time employment, working hours and health outcomes

Numerous studies have reported associations between part-time employment and health. Health has been found to be negatively impacted by nursing employment (Wetzel et al. 1990). Nonetheless, some research has concluded that part-time work did not seem to affect health. For instance, work status rarely acted as a moderator in the correlations between psychological contract fulfilment and outcomes (Conway–Briner 2002). When it comes to aspects of job-related happiness, organisational commitment, intent to leave, and job satisfaction, there is little difference between full-time and part-time employees (Thorsteinson 2003). No differences were found in the health status of full-time and part-time teachers (Seibt et al. 2012), and no difference in the risk of burnout between full-time and part-time teachers (Seibt–Kreuzfeld 2021).

The majority of studies have focused on the beneficial association between part-time employment and health outcomes, despite the availability of studies that have not demonstrated any interdependence between types of job and health. For instance, employees who worked part-time reported worse health-related outcomes than those who worked full-time, with increased stress and depression acting as a partial mediating factor (Rosenthal et al. 2012). Part-time employees report worse physical and mental health than full-time employees, and health status varies by work hours and shift type (Kleiner–Pavalko 2010). Stress and musculoskeletal diseases are linked to irregular hours and insecurity (Zeytinoglu et al. 2015). Lastly, there may be a connection between choosing unusual work arrangements and mental health (Pirani 2017).

Studies have also revealed that 'precarious' occupations put employees' health at risk (Kawachi 2008). Health complaints were predicted by job perceptions (job insecurity, job control, and demands), but not by the type of employment contract (Bernhard-Oettel et al. 2005). Additionally, fatigue, backache, and muscle aches tended to correlate positively with precarious employment, especially full-time

precarious employment (Benavides et al. 2000). Many people with disabilities find it difficult or impossible to engage in typical full-time occupations due to health issues (Schur 2003).

Employers often respond, particularly during recessions, by reducing health insurance for part-time employees or hiring more part-timers (Fronstin 2012). Full-time employees with fixed-term contracts are more likely to report poor health than those with permanent work contracts, even if the health status of part-timers with permanent contracts is not much different from that of full-timers (Rodriguez 2002).

Hypothesis 1: We suggest that part-time work may be negatively associated with health outcomes based on the gaps and resource depletion patterns identified in the aforementioned studies.

A notable portion of the scientific literature has examined the connection between health indicators and extended work hours. Specifically, researchers have found no significant correlation between overtime and fatigue across any contract-hour group. Additionally, overtime was not associated with increased work motivation for part-time employees, but it was for full-time employees (Beckers et al. 2007). Nevertheless, other research has shown that overtime is associated with increased occupational stress and perceptions of overwork (Grosch et al. 2006). Specifically, among men, working 51–60 hours per week was consistently linked to poor mental health, self-reported hypertension, job dissatisfaction, smoking, sleep deprivation, and lack of leisure physical activity; among women, the association was limited to smoking and sleep deprivation (Artazcoz et al. 2009). Certain occupations are associated with unique work schedules; full-time inspectors, for instance, typically experience the highest job stress and the lowest work environment scores, strains, and social support (Wilkes et al. 1981).

Hypothesis 2: We infer that extended workdays and overtime may be negatively associated with health outcomes based on the findings of the aforementioned studies.

Gender, age and health outcomes

Traditionally, researchers have focused on individual factors. The two most fundamental explanatory factors are age and gender. Nonetheless, many studies view these characteristics as distinct and significant determinants. In terms of gender, for instance, research indicates that full-time employment is associated with slower declines in physical functioning and subjective health for both men and women (Ross–Mirowsky 1995). Part-time work is linked to worse health

and is more prevalent among men. In contrast, part-time work was generally linked to fewer psychosocial issues among women (Bartoll et al. 2014).

Women who were not in the labour force tended to have the worst health. In contrast, full-time employees tended to have the best health, and part-timers tended to have intermediate health (Herold–Waldron 1985). Health issues and an effort-reward imbalance were shown to be significantly correlated among female part-time employees of a retail company (Kobayashi et al. 2005). Stress from part-time and casual jobs can lead to migraine headaches, repetitive strain injuries, low self-esteem, low motivation, and job discontent. Stress is a significant occupational health issue for women (Zeytinoglu et al. 2005).

Hypothesis 3: We suggest that part-time work may be negatively associated with health outcomes, and trends can be different for men and women. Therefore, we propose that gender significantly shapes the association between part-time work and health outcomes.

Age is another element that has a significant impact on health outcomes. For instance, mothers who experience ongoing unemployment report much worse health at age 40 than do part-time workers with low unemployment (Frech–Damaske 2012). Compared to their peers without disabilities, older individuals with disabilities (those between the ages of 50 and 64) are more likely to work part-time. Many older workers with impairments work part-time to better manage their work and health, despite the significant employment gap between the two groups (Pagán 2009).

One piece of research found that people aged 65 years and older experience worsening mental health after retirement; their mental health deteriorates particularly quickly. However, this did not occur when participants switched from full-time to part-time employment (Minami et al. 2015). For those over 64, evidence suggests that continued work has positive or neutral effects on physical and general health, as well as mixed effects on mental health (Baxter et al. 2021). As a result, offering retirees paid, voluntary work opportunities can clearly improve their well-being (Soumerai–Avorn 1983).

Hypothesis 4: We suggest that part-time work may be negatively associated with health outcomes, and trends can be different for age groups. Therefore, age is a significant factor in the association between part-time work and health outcomes.

Early part-time sick leave and return to work

The relationship between sick leave and return to work has been the subject of substantial research. For instance, it was discovered that in the early stages of

musculoskeletal disorder-related work incapacity, part-time sick leave enhanced self-rated general health and health-related quality of life (Shiri et al. 2013). For individuals with musculoskeletal diseases, early part-time sick leave may offer a quicker and more sustainable return to regular tasks than full-time sick leave (Viikari-Juntura et al. 2012). For those with mental illnesses and musculoskeletal disorders, part-time sick leave during the first three months improves return to work and overall work participation over a two-year period (Viikari-Juntura et al. 2017).

However, other research has demonstrated that long-term sick absence (>28 days) has detrimental implications for employees' working conditions, health, and lifestyle, including effects on income growth, career advancement opportunities, and job switching. Even after returning to full-time employment, sick leave appeared to significantly reduce respondents' enthusiasm for their jobs (Sieurin et al. 2009).

*Hypothesis 5:*We suggest that part-time work may be negatively associated with health outcomes, as short-term sick leave significantly contributes to the association between part-time work and health outcomes.

Part-time employment and family commitments

Work-family conflict has been linked to spouses' part-time jobs in a number of studies. Full-time and part-time employees exhibited a socioeconomic gradient in job characteristics, and all employment-status groups were associated with disparities in self-reported health, with homeworkers showing the greatest differences (Matthews et al. 1998). However, the stated motivation for working part-time and being open to doing so was the same: the value of family and recreational activities (de Jong et al. 2006). Part-time work can improve work-family balance for all employees, not just those who specifically choose it as a way to lessen work-family imbalance (Van Rijswijk et al. 2004).

Men are subject to a part-time wage penalty, although they make up fewer than one-third of all part-time workers (Hirsch 2005). Men who work full-time without overtime report the highest job satisfaction; however, neither job happiness nor life contentment is affected by hours worked. Women prefer part-time jobs, regardless of duration, in terms of job happiness and hours worked, but their personal contentment is essentially unaffected by work hours (Booth – Van Ours 2008).

The leisure activities of female part-timers in lower-level occupations paint a less favourable picture of their 'life balancing' than is typically depicted in work-family literature. Because women make up the majority of National

Health Service employees and seek to balance career opportunities with family responsibilities, part-time work increases dissatisfaction (Branine 2003). Motivational and work-context differences between career and non-career women may explain women's varying reactions to part-time employment (Higgins et al. 2000).

Women were found to be the least financially secure workers and, as a result, less content with their social lives (Warren 2004). Women's self-rated health and poor sleep quality are linked to work-home interference. Unwinding appears to mitigate the relationship between work-home interference and health, but only among women (Nylén et al. 2007).

Hypothesis 6: We suggest that part-time work may be negatively associated with health outcomes and family responsibilities are a significant factor in this association.

DATA AND METHODS

The European Working Conditions Survey (EWCS) Integrated Data File for the years 1991 to 2015 provided the data for this study. Since its inception in 1990, the EWCS has provided an overview of working conditions in Europe. The survey analyses relationships between various aspects of working conditions, identifies groups at risk and issues of concern as well as progress, monitors trends by providing homogeneous indicators on these issues, and contributes to the development of European policies on employment and quality of work. It also evaluates and quantifies working conditions for both employees and self-employed people across Europe on a harmonised basis. Employment status, working hours and organisation, learning and training, physical and psychosocial risk factors, health and safety, work-life balance, worker participation, earnings and financial stability, and work and health are among the topics that are addressed. A random sample of workers (employees and independent contractors) was interviewed in person for each wave. The survey included EU Member States. The data included 5,646 respondents in Finland.

Study outcome

The question asked of respondents about their health was: 'How is your health in general?', with a response scale from 1 to 5 (1 – very good, 2 – good, 3 – fair, 4 – bad, 5 – very bad). To categorise the health outcome variable, we combined

the items of the above-mentioned variable into a nominal variable. Following Rodriguez (2002), we divided responses into two groups: members reporting very good or good health, and those reporting fair, bad, or very bad health. In contrast, Kawachi (2008) used self-rated health status (i.e., the single-item question: 'How would you rate your overall health?'), dichotomising responses as 'poor' vs 'good,' 'very good,' or 'excellent.' Booth and Van Ours (2008) also used a health variable based on self-assessed health status, ranging from 1 to 5, from 'very poor' to 'excellent'. Artazcoz et al. (2009) used self-perceived health status by asking respondents to describe their general health as 'excellent,' 'very good,' 'good,' 'fair,' or 'poor'. The variable was dichotomised by combining the categories 'fair' and 'poor' to indicate poor health status and the categories 'excellent,' 'very good' and 'good' to indicate good health status.

Main exposure variable

As the main item of interest, we categorised employment status into two groups: part-time and full-time. Respondents were asked to report their employment status using the following question: 'And do you work part time or full time?', with binary response options '1' or '2' (1 – part time, 2 –full time). We followed the approach proposed by Rodriguez (2002). However, we did not categorise observations into the following groups: full-time employed with permanent contract, with fixed-term contract, without contract; working 20 to 30 hours per week with permanent contract, with fixed-term contract, without contract; working less than 20 hours per week with permanent contract, with fixed-term contract, without contract; unemployed, housewives or househusbands, students, retired, other. In our case, we used a variable that described only two types of employment.

Rodriguez (2002) and Benavides et al. (2000) investigated types of employment classified into nine categories as follows: full- and part-time permanent employment, full- and part-time fixed-term employment, full- and part-time temporary employment, full- and part-time sole traders (self-employed with no employees), and small employers (employers employing between one and nine people). Using standard definitions of part-time work, participants were classified as part-time if they reported working fewer than 35 hours per week.

An alternative exposure variable was working hours. Namely, the question asked of the respondents about working hours was: 'How many hours do you usually work per week in your main paid job?', with a response scale ranging from 1 to 4 (1 – 1–15 hours, 2 – 16–29 hours, 3 – 30–40 hours, 4 – more than 40 hours). We followed the approach of Booth and Van Ours (2008), who

distinguished four categories of weekly working hours:1–15 (small part-time job), 16–29 (large part-time job), 30–40 (full-time job), and 40+ (job with overtime hours). The first category, 1–15 hours, is special because workers in this group are eligible for certain in-work benefits. This category was labelled 'small part-time jobs'.

Other studies have also used similar variables in their analysis. Bartoll et al. (2014) measured full- and part-time employment using a working-hours variable based on the question, 'How many hours do you work per week in your main job?', with an open response indicating the number of working hours/week. Individuals who worked ≤30 hours/week were defined as being in part-time employment and were divided into two categories: 5–19 hours/week and 20–30 hours/week. Individuals who worked 31–40 hours/week were defined as being in full-time employment (the reference category).

Artazcoz et al. (2009) used the working hours variable, which was determined using the question: 'In the last week (or the last whole week you worked), how many hours did you work?' The response alternatives were <30 hours (part-time job), 30–40 hours (reference category), 41–50 hours, and 51–60 hours per week. Hirsch (2005) also classified working hours as follows: part-time: 1–20 hours and 21–34 hours; full-time: 35–39 hours, 40 hours, 41–49 hours, and 50+ hours. De Jong et al. (2006) also used a working-hours variable based on the question: 'How many hours are you working every week?'.

Covariates

Following Rodriguez (2002), we controlled the models for fixed personal characteristics such as gender, age, occupation, education, industry, sector, and permanent vs. temporary employment (contract). The gender variable has been widely used in studies by Benavides et al. (2000), Bartollet al. (2014), Viikari-Juntura et al. (2017), de Jong et al. (2006), and Booth and Van Ours (2008). The age variable is used widely in studies, including Benavides et al. (2000), Kawachi (2008), Bartoll et al. (2014), Viikari-Juntura et al. (2017), de Jong et al. (2006), and Hirsch (2005). Kobayashi et al. (2005) divided subjects into three age groups: under 35, 40–44, 45–49, and 50–63 years. We slightly modified the age groups and included them in the analysis as follows: 15–29, 30–44, 45–54, 55–64, and older than 65 years (Riekhoff et al. 2019).

The occupation variable was used by Bartoll et al. (2014), Kobayashi et al. (2005), Kawachi (2008), and Hirsch (2005). The education variable was used by Kobayashi et al. (2005), Kawachi (2008), and Booth and Van Ours (2008). Kawachi (2008) and Hirsch (2005) used the industry variable as a covariate.

Employment sector (public *versus* private) was added as a covariate in studies by Viikari-Juntura et al. (2017).

Bartoll et al. (2014) considered two types of contracts: permanent (reference category) and temporary, including fixed-term, temporary agency contract, learning, and no contract. Artazcoz et al. (2009) identified only three contract types (permanent, fixed-term temporary contract, and non-fixed-term temporary contract). Kawachi (2008) studied non-standard employment and defined it as part-time work, daily or temporary work, and fixed-term contract ('contingent') work. Together, these arrangements were labelled 'precarious' work.

We also examined several aspects of sick leave using three variables: days absent from work due to sick leave, employment during a sick leave period, and working days during sick leave. As Viikari-Juntura et al. (2017) propose, we used partial sick leave and full-time sick leave (e.g., number of compensated days during the preceding two years).

Following Rodriguez (2002), we controlled the models for the number of family members. Booth and Van Ours (2008) also used partner characteristics in their analysis, in particular health and labour market position (partner's part-time or full-time status, and partner's working hours). We also used several covariates related to family situation, such as household size and partner's working hours.

Statistical analyses

We used chi-square tests to investigate statistical dependence between health outcomes and predictors. Similarly, for example, Bartoll et al. (2014) analysed gender differences by regional typology for all variables (chi-square tests for categorical variables and Student's t-tests for age). Kobayashi et al. (2005) studied associations between psychosocial job stressors and tobacco use, alcohol consumption, lack of exercise, and relative weight using χ^2 tests.

Next, we used binary logistic regression with a binomial response and a logit link function. We utilised the MASS library for the generalised linear model (GLM) analyses. We transformed the log rate ratios of the GLM to odds ratios (OR) with 95% confidence intervals (CI) via exp(log rate ratios) and exp(log rate ratios ± 1+0.96 × SE) functions. R (version 4.5.1) was used for all analyses.

Our statistical model is based on the statistical approach proposed by other researchers in their studies. For example, Rodriguez (2002) used discrete-time logistic regression analyses using the SPSS statistical package. The analytical model controls for individual characteristics such as age, gender, marital status, and years of education, as well as household characteristics including

type of house ownership, total household income, and number of household members.

Benavides et al. (2000) employed logistic regression models to ascertain whether each of the six health indicators used as dependent variables and nine or four categories of work used as independent variables were significantly correlated. For every health indicator, multivariate models were constructed, first controlling for age and gender and then incorporating extra individual-level factors.

Factors related to working 41–50 or 51–60 hours per week as opposed to working 30–40 hours were examined by Artazcoz et al. (2009). The relationships between extended work hours and all of the health indicators were examined using multiple logistic regression models that were adjusted for age, gender, and employment and family variables.

Bartoll et al. (2014) calculated the association between individuals in part-time employment and full-time employment with adverse versus non-adverse working conditions. For each analysis, they calculated odds ratios (OR) and 95% confidence intervals (95% CI) by fitting logistic regression models adjusted for sociodemographic characteristics (gender and region).

Using multiple logistic regression, Kobayashi et al. (2005) investigated the relationships between psychological job stressors and risk variables for coronary heart disease. In order to predict each coronary heart disease risk factor, four psychosocial job stressors (job strain, supervisor support, coworker support, and effort-reward imbalance) were added to the model while all covariates (age, tobacco use, alcohol consumption, lack of exercise, education, marital status, childbearing history, and medical treatment for disease) and occupation were controlled.

Since our data come from a pooled cross-sectional survey (EWCS), running a binary logistic regression requires addressing potential issues with data independence. Because we analyse Finland over multiple waves (1991–2015), observations within the country may be correlated over time. To ensure the validity of our results and account for time-varying institutional changes, economic cycles, and policy shifts, we included year (survey wave) fixed effects in all multivariate regression models. This approach effectively controls for unobserved macro-level variations specific to each survey year.

The EWCS provides specific weight variables to correct for sampling biases and country population sizes. We applied these weights in our software to ensure our percentages and logit coefficients represented the actual population. For the Finnish sub-sample (n=5,646), sampling weights were applied, properly adjusting for the complex survey design and subpopulation estimation.

RESULTS

Descriptive statistics

First, descriptive statistics, including proportions, were estimated. Table A1 in the Appendix displays the descriptive statistics for the final data derived from years 1991–2015 (n=5,646 people) (Table A1). The average proportion of people with very good or good health was 75.5%, and the average proportion of workers with part-time jobs was 12.5%. The average proportion of men was 47.4%. The majority of workers had completed short-cycle tertiary education (29.3%) or upper secondary education (28.1%).

Second, summary statistics, means with standard deviations (SD), were estimated. The mean number of working days during sick leave was 10.2 (range 1–300) (See Table A2 in the Appendix). The mean number of partner working hours was 40.4 (range 0–100).

Chi-square statistics

Third, following other studies, we estimated chi-square coefficients for the health outcome and explanatory variables. The results of the chi-square test are shown in Table A3 in the Appendix. All the relevant variables used in the analysis were chosen for the final logistic regression models. A chi-square test of independence was performed to examine the relationship between health and type of employment (part-time or full-time): the relation between these variables was significant: X^2 (1, N=3482)=6.734, p=0.0094. Other statistically significant relations were found for health and working hours, age, education, occupation, industry, work during sick leave, and number of people in a household.

The proportion of subjects who reported having fair, bad or very bad health did not differ by gender, X^2 (1, N=5645) =0.767, p >0.05. A chi-square test of independence showed that there was no significant association between health and type of contract: X^2 (1, N=4792)=0.274, p=0.60.

Binary logistic regression

To test our research hypotheses, we ran binary logistic regression models. For example, Table A4 in the Online Appendix presents the binary logistic

regression results for the likelihood of reporting fair, bad, or very bad health by employment status, working time, and other control variables.

For example, a one-unit increase in the predictor variable 'employment (part-time *vs.* full-time)' was associated with an average change of 0.564 in the log odds of the response variable 'health' (Model 1). This means that part-time employment is associated with higher rates of reported health deterioration. We therefore confirm *Hypothesis 1* that part-time work may be negatively associated with health outcomes.

Model 2 adjusted for part-time employment by categorising working hours into several groups. In particular, it was found that in comparison to the reference group (30–40 working hours per week), part-time employment (1–15 and 16–29 working hours per week) was associated with higher rates of reported health deterioration (log odds of 0.438 and 0.355, respectively). In this case, we again confirm *Hypothesis 1* but also *Hypothesis 2*: long working hours and overtime are negatively associated with worse health outcomes (log odds of 0.312).

Further, Model 3 was controlled for employment (part-time vs full-time) and gender. We found that part-time employment was associated with higher rates of reported health deterioration, and men potentially have higher rates than women (log odds of 0.300). However, this result is not statistically significant. We thus cannot confirm *Hypothesis 3* that gender plays a role in the association between part-time employment and health outcomes.

Model 4 was controlled for employment (part-time vs full-time) and age groups. We found that, along with the same effect of part-time employment on health outcomes, three age groups potentially have worse health outcomes than those aged 30-44 years: those aged 45–54 years old (log odds of 0.744), 55–64 years old (log odds of 1.097) and 65-98 years old (log odds of 1.192). We therefore confirm *Hypothesis 4: age* plays a role in the association between part-time employment and health outcomes.

As a whole, Model 5 was controlled for employment (part-time vs full-time) and other individual characteristics such as gender, age (group), occupation, education, industry, sector and permanent vs temporary employment. We found that the negative effect of part-time employment on health outcomes is more significant for skilled agricultural, forestry and fishery workers as well as for plant and machine operators and assemblers.

Further, we hypothesised that part-time employment, combined with short-term sick leave, may be negatively associated with health outcomes (*Hypothesis 5*). In order to verify this hypothesis, we constructed three models (Models 6, 7 and 8). Thus, Model 6 was controlled for employment (part-time vs full-time), individual characteristics from Model 5, and the number of days absent from

work due to sick leave. In particular, we found that higher rates of reported health deterioration are associated with part-time employment and longer sick leave. For example, the log odds are statistically significant for the categories '10 to 19 days,' '20 to 49 days' and '50 days or more'.

Model 7 was controlled for employment (part-time *vs.* full-time), individual characteristics from Model 5 and employment during a sick leave period. In particular, we found that the log odds of worse health outcomes are lower for people who did not work while sick or were not sick at all (log odds are –1.047 and –2.405, respectively) than for those who worked while sick. Model 8 was controlled for employment (part-time vs full-time), individual characteristics from Model 5 and number of working days during sick leave. In particular, we found that more working days during sick leave were associated with higher rates of reported health deterioration (log odds =0.041).

Overall, we confirmed *Hypothesis 5*: part-time employment, combined with short-term sick leave, may be negatively associated with health outcomes. We also found that part-time employment and longer sick leave are associated with worse health, and that health outcomes worsen for people who worked while sick. More working days during sick leave were also associated with higher rates of reported health deterioration.

Finally, our last hypothesis suggested that part-time employment, combined with family commitments, may be negatively associated with health outcomes (*Hypothesis 6*). In particular, Model 9 was controlled for employment (part-time vs full-time), individual characteristics and the number of people living in a household. We did not find a statistically significant result supporting the assumption that larger families are associated with health outcomes. Model 10 was controlled for employment (part-time vs full-time), individual characteristics and partner's working hours. Again, we did not find a statistically significant result supporting the assumption that a partner's working hours affect health outcomes. Therefore, we can not confirm *Hypothesis 6* due to the limited assumptions and statistical results.

Based on the results in Table A4, we chose log odds for part-time employment to estimate the results from all models as odds ratios with confidence intervals (Table A5 in the Online Appendix).

We find that in Models 7 and 8, the impact of part-time employment on health outcomes is most significant. As mentioned earlier, Model 7 controlled for employment during a sick leave period (OR of 3.09), and Model 8 controlled for the number of working days during a sick leave period (OR of 3.91). Predictors in these models were statistically significant. Compared with Models 9 and 10, which also show noticeable interdependence between part-time employment and health outcomes, the predictors in these models were not statistically significant

(OR of 2.71 and OR of 5.35, respectively). Confidence intervals in Models 9 and Model 10 are too wide to infer statistical significance.

Visualisation of results and prediction

Figure 1 shows the effect of gender on health, as in Model 3. Model 3 was controlled for employment (part-time vs full-time) and gender. The scale of the outcome variable ('health') is coded as between 0 and 1. Therefore, we can generate predictions with this plot, which by default sets the offset at 1. This means we can interpret the predictions as percentages. We can also see that, for men, the probability of worsened health is slightly higher (around 25%) than for women (around 20%). Partial residuals are shown as having 0.00 and 1.00 values on the scale of the outcome variable. Confidence intervals are also shown.

Figure 1. *Effect plot produced for Model 3 –effect of gender on health outcome*

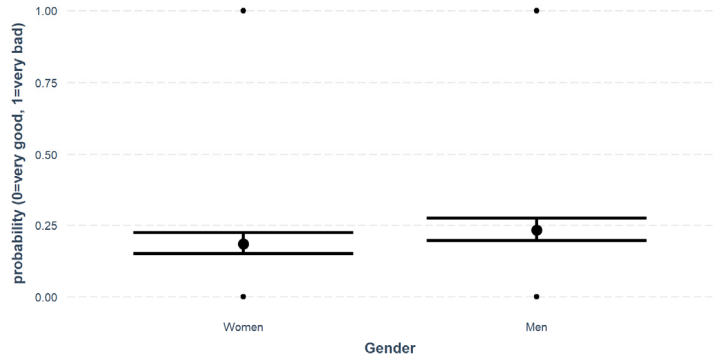


Figure 2 shows the effect of age groups on health outcome after Model 4, which controlled for employment (part-time *vs.* full-time) and age groups. As can be seen, in comparison to the reference age group (30–40 years old), the younger population (15–29 years old) has potentially better health outcomes, while the older population has worse health outcomes. This means that as age increases, health outcomes become worse.

Figure 3 shows the effect of the number of days absent from work due to sick leave on health outcomes. Model 6 was controlled for employment (part-time vs full-time), gender, age groups, occupation, education, industry, sector, permanent vs temporary employment and number of days absent from work due to sick leave. Figure 3 shows a clear dependence between longer sick leave and health outcomes: longer sick leave may lead to worse health outcomes (up to a 70% probability).

Figure 2. *Effect plot produced for Model 4 – effect of age on health outcome*

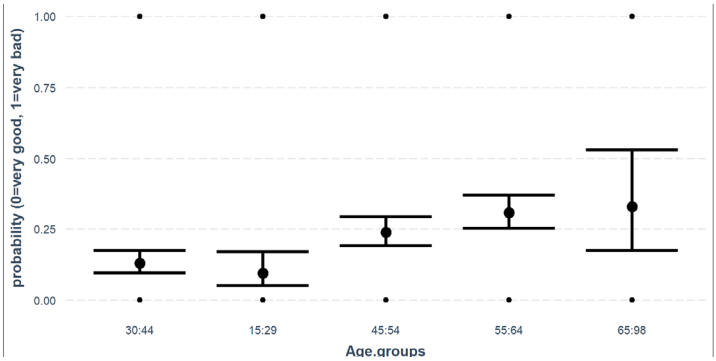


Figure 3. *Effect plot produced for Model 6 – effect of number of days absent from work due to sick leave on health outcome*

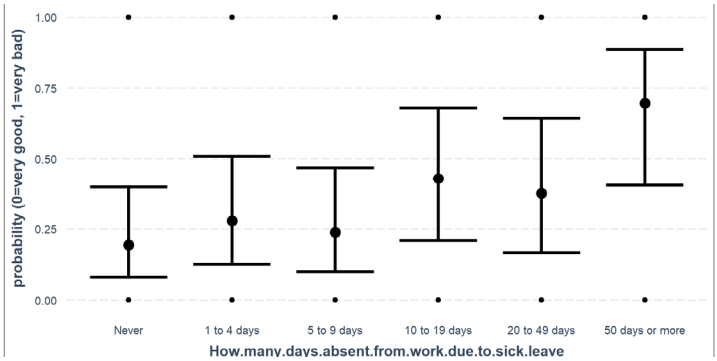


Figure 4 shows the effect of employment during sick leave on health outcomes. Model 7 was controlled for employment (part-time vs full-time), gender, age group, occupation, education, industry, sector, permanent vs temporary employment and employment during a sick leave period. The figure shows that employment during sick leave increases the probability of worsened health by up to 40%, while no employment predicts only around 5%.

Figure 5 shows the effect of the number of working days during sick leave on the health outcome. Model 8 was controlled for employment (part-time vs full-time), gender, age groups, occupation, education, industry, sector, permanent vs temporary employment and number of working days during sick leave. It can be

seen from the figure that a longer working period during sick leave potentially predicts worse health by up to 100%.

Figure 4. *Effect plot produced for Model 7 –effect of employment during sick leave on health outcome*



Figure 5. *Effect plot produced for Model 8 –effect of number of working days during sick leave on health outcome*



Figure 6 shows the effect of household size on health outcomes. Model 9 was controlled for employment (part-time vs full-time), gender, age (groups), occupation, education, industry, sector, permanent vs temporary employment and number of people living in a household. The figure shows that dependence is almost zero because the line remains parallel to the x-axis across the range of the predictor variable. All this means that the number of people in a household slightly positively affects health outcomes.

Figure 6. *Effect plot produced for Model 9. Effect of number of people living in a household on health outcome*

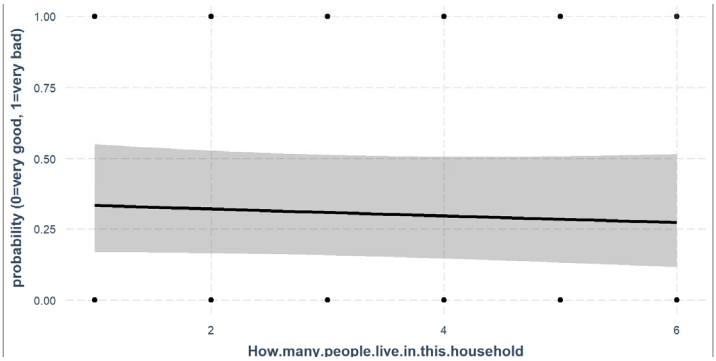
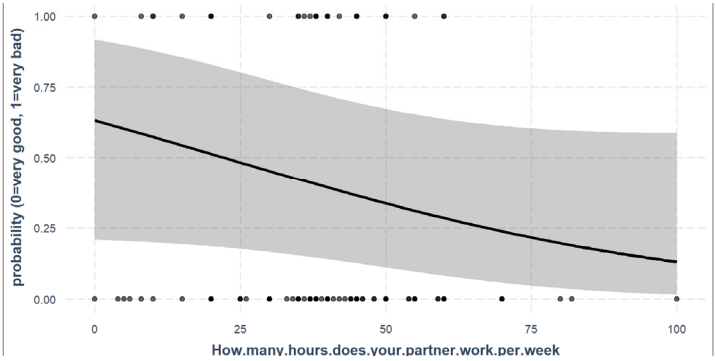


Figure 7 shows the effect of the partner's working hours on health outcomes. Model 10 controlled for employment (part-time vs full-time), gender, age groups, occupation, education, industry, sector, permanent vs temporary employment and partner's working hours. The figure suggests that longer partner working hours may predict better health outcomes.

Figure 7. *Effect plot produced for Model 10. Effect of partner's working hours on health outcomes*



DISCUSSION

The European Working Conditions Survey Integrated Data File for the years 1991 to 2015 provided the data for this study. The purpose of this study was to examine relationships between a particular kind of work and health. We framed our study using the lifestyle preferences approach, viewing lifestyle preferences as internal resources or orientations that shape resource-loss cycles, and found that part-time work is linked to a higher risk of deteriorating health.

First, we investigated the impact of part-time employment and working hours on workers' health. Our findings are consistent with prior research that indicates precarious workers are twice as likely as non-precarious workers to report poor health (Kawachi 2008). Compared to full-time employees with permanent contracts, employees in several job groups are more likely to report fair, bad, or very poor health. Those without permanent contracts who work fewer than 20 hours per week have a higher odds ratio (OR) of 1.74 (Rodriguez 2002). Overall, job dissatisfaction, exhaustion, backache, and muscle aches were more common among those with unstable employment than among people with permanent jobs (Benavides et al. 2000).

In addition to studying part-time employment, we also looked at working hours in general. We find that long hours and overtime are positively correlated with worse health outcomes. Our findings align with other research. Some studies have found gender differences in the factors linked to extended work hours. Men who worked 51–60 hours a week consistently showed an association with poor mental health, self-reported hypertension, job dissatisfaction, smoking, sleep deprivation, and little physical exercise during leisure time, while an association with smoking and sleep deprivation was only found for women (Artazcoz et al. 2009). Higher job stress was associated with overtime work (Grosch et al. 2006). In a number of significant ways, employees who work overtime are different from their part-time and full-time counterparts. There appears to be a linear association between some of these characteristics and the number of overtime hours worked.

Second, we investigated the impact of age and gender on the relationship between particular types of jobs and health outcomes. We discovered that working part-time is linked to a higher risk of deteriorating health. The health of men may be worse than that of women. However, our findings are not statistically significant. Part-time work, or 'mini-jobs', has also been linked to worse job satisfaction and poorer health, and more work-related psychological issues in men, according to another study (Bartoll et al. 2014). However, other research has demonstrated that the likelihood of women reporting poor health status is the same as that of men (Rodriguez 2002). While men were more

likely to work 41–50 or 51–60 hours, women were more likely to work part-time (Artazcoz et al. 2009). However, there were no gender differences in job satisfaction related to health outcomes. While self-reported hypertension was more common among men, women were more likely to have poor self-perceived health and mental wellbeing.

In addition to gender, we looked at how age affected the association between part-time work and health. Specifically, we found that health outcomes may be worse for individuals over 45 than for those aged 30 to 44. Our findings are consistent with prior research that found that long workdays were more common among shift workers and inversely correlated with age (*ibid*.). Compared to their peers without disabilities, older persons with disabilities (those between the ages of 50 and 64) are more likely to work part-time. To better balance their health and professional lives, many older people with disabilities take part-time jobs (Pagán 2009).

Third, we explored how health outcomes are impacted by sick leave. We discovered that working part-time and taking longer periods of sick leave were linked to worse health. Additionally, we discovered that those who worked while on sick leave were more likely to experience worse health outcomes than those who did not. We also found that health outcomes worsened the more days people worked while on sick leave. Our findings align with prior research showing that work participation in the part-time sick leave group rose quickly to about 85% and remained about 10% higher than in the full-time sick leave group throughout the follow-up period (Viikari-Juntura et al. 2017).

Last, we enquired about the impact of employees' family circumstances on health outcomes. The hypothesis that larger families can affect health outcomes did not yield statistically significant results. Nor did the hypothesis that a partner's working hours may affect health outcomes. However, other research has revealed that men with two or more children were more likely to work 41–50 hours, while there was no correlation between extended workdays and family responsibilities among women (Artazcoz et al. 2009).

Family and leisure activities are cited as significant factors by people who work part-time and those who are inclined to work part-time, according to previous studies. Such decisions are influenced by continuity of care and efficiency (de Jong et al. 2006). Women with children are considerably happier if they have a job, regardless of the number of hours it requires, whereas women without children do not care about their working hours. An individual's own well-being is usually not statistically significantly impacted by the health or employment position of their partner (Booth – Van Ours 2008).

After completing the study, we conclude that both extended work hours and overtime are negatively associated with worse health outcomes, and that part-

time employment is linked to a higher chance of worse health. We have reported numerous instances from the scientific literature regarding the impact of part-time employment on health outcomes. Numerous additional research studies from throughout the world have verified the significance of our findings, which show that working part-time can be detrimental to people's health and well-being. One important issue in this is age. Globally, age discrimination frequently has an impact on people's working lives. The need to continue working despite pre-existing illnesses is another factor. The reason why health outcomes worsen despite medical interventions is attributed to working during sick leave. Our findings corroborate other studies in related fields in several ways. With our research, we also add to our understanding of Finland's status as a Scandinavian welfare state model nation.

Comprehensive data for this study were gathered from the cross-sectional EWCS between 1991 and 2015 (the sample consisted of 5,646 respondents). Thus, this study's strengths included its ability to examine relationships between part-time employment and health using comprehensive European data and a representative sample. The use of extensive survey data spanning six years (1991, 1995, 2000, 2005, 2010, and 2015) is another asset.

The primary weakness of this study lies in the cross-sectional nature of the data (EWCS 1991–2015) and the impossibility of establishing causality between part-time work and health outcomes. Without longitudinal tracking of individuals transitioning between employment types, endogeneity and reverse causality remain unaddressed. Due to the cross-sectional design of the EWCS, we cannot definitively establish the temporal order of events. While we hypothesise that part-time work is associated with health outcomes, reverse causality remains a distinct possibility. For instance, workers in poorer health may select part-time schedules to accommodate their medical needs. This reflects the 'healthy worker effect' or selection bias, meaning individuals with pre-existing poor health may selectively move into or remain in part-time employment, rather than part-time work solely driving health outcomes.

Therefore, this study's primary drawback may be its cross-sectional design, which limits the use of longitudinal measures. It would be beneficial to examine changes from full-time to part-time employment as a result of sick leave based on longer-term research. Examining health changes throughout the move from full-time to part-time employment may be helpful. The identification and differentiation of the long-term and short-term impacts of organisational changes on the health and welfare of employees would be aided by longitudinal data.

The sampling method is an additional constraint. The sample for this study was limited to 5,646 respondents who were employed or self-employed. However,

aggregate data include information on other demographic groups excluded from this survey, such as students, homeworkers, retirees, and unemployed people. The study's restriction to Finland and the absence of comparative analysis with other European nations constitute yet another drawback. More research is required to confirm our results in different contexts and incorporate additional European nations into the analysis.

Our findings regarding working during sick leave yielded high odds ratios accompanied by wide confidence intervals, reflecting a degree of statistical uncertainty. This result was primarily driven by data structure and cell sparsity, as a relatively small number of participants reported working during sick leave (n=982). Consequently, while these estimates capture a strong underlying effect size within this subsample, the small cell count limits their numerical precision. We therefore caution readers when interpreting the exact magnitude of these particular odds ratios.

Despite these restrictions and limitations, this study offers strategic information about part-time work and its impact on health outcomes for businesses, employees, and decision-makers. Although we included industry as a covariate in the logistic regression models, we have not highlighted its significance as an indicator of health outcomes. In certain industries, such as the social and healthcare sectors, part-time work is common, as we mention below. We plan to examine the welfare impacts of part-time labour in the healthcare sector in a future study.

CONCLUSIONS

Given the major changes organisations are currently undergoing, it is crucial to gather more specific information on the relationship between part-time employment, employee well-being, and health. By examining these phenomena holistically, this research can provide strategic information to decision-makers, employers, and employees, and create opportunities for organisational growth.

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APPENDIX

Table A1. *Descriptive information for categorical variables, European Working Conditions Survey, 1991–2015 (N=5,646)*

Variables	N	%
How is your health in general? Would you say it is:		
Very good and good	1531	75,49
Fair, bad and very bad	497	24,51
Total	2028	100,00
And do you work part-time or full-time?		
Full time	3046	87,48
Part time	436	12,52
Total	3482	100,00
What kind of employment contract do you have for your main paid job?		
An indefinite contract	3851	80,36
A fixed-term contract, a temporary employment agency contract, an apprenticeship or other training scheme, other	941	19,64
Total	4792	100,00
Gender		
Women	2972	52,65
Men	2673	47,35
Total	5645	100,00
What is the highest level of education or training that you have successfully completed?		
Short-cycle tertiary education	293	29,33
Primary education	30	3,00
Lower secondary education	66	6,61
Upper secondary education	281	28,13
Post-secondary non-tertiary education	122	12,21
Bachelor or equivalent	49	4,90
Master or equivalent	146	14,61
Doctorate or equivalent	12	1,20
Total	999	100,00
ISCO_08 1-digit		
Service and sales workers	423	20,91
Armed forces occupations	9	0,44
Managers	101	4,99
Professionals	360	17,80
Technicians and associate professionals	358	17,70
Clerical support workers	141	6,97
Skilled agricultural, forestry and fishery workers	90	4,45

Variables	N	%
Craft and related trades workers	228	11,27
Plant and machine operators, and assemblers	140	6,92
Elementary occupations	173	8,55
Total	2023	100,00
Are you working in the:		
Private sector	3322	62,07
Public sector	2030	37,93
Total	5352	100,00

Table A1 *(continued). Descriptive information for categorical variables, European Working Conditions Survey, 1991–2015 (N=5,646)*

Variables	N	%
Sector of activity – NACE Rev. 2 – 10 categories		
Other services	427	21,13
Agriculture	117	5,79
Industry	295	14,60
Construction	141	6,98
Commerce and hospitality	260	12,86
Transport	108	5,34
Financial services	53	2,62
Public administration and defence	74	3,66
Education	174	8,61
Health	372	18,41
Total	2021	100,00
In the past 12 months, how many days have you been absent from work due to sick leave or health-related leave?		
Never	2645	47,25
1 to 4 days	1044	18,65
5 to 9 days	709	12,67
10 to 19 days	553	9,88
20 to 49 days	396	7,07
50 days or more	251	4,48
Total	5598	100,00
In the past 12 months, did you work while sick?		
Yes	982	48,57
No	981	48,52
I was not sick (spontaneous)	59	2,92
Total	2022	100,00

Variables	N	%
How many hours do you usually work per week in your main paid job?		
30–40	3977	71,39
1–15	270	4,85
16–29	370	6,64
41–168	954	17,12
Total	5571	100,00
How old are you?		
30–44 years old	2117	37,50
15–29 years old	1021	18,09
45–54 years old	1519	26,91
55–64 years old	885	15,68
65–98 years old	103	1,82
Total	5645	100,00

Table A2. *Summary statistics for numeric variables, European Working Conditions Survey, 1991–2015 (N=5646)*

	Min.	Median	Mean	St. Dev..	Max.	N
Including yourself, can you please tell me how many people live in this household?	1.000	2.000	2.588	1.304	6.000	5641
How many working days? [Did you work when you were sick?]	1.00	5.00	10.23	19.876	300.00	943
How many hours does your partner normally work per week, including any paid or unpaid overtime?	0.00	40.00	40.45	10.997	100.00	511

Table A3. *Results of Pearson's Chi-squared test for health outcome and explanatory variables*

Variable	X-squared	df	p-value
And do you work part-time or full-time?	6.734	1	0.009459
What kind of employment contract do you have for your main paid job?	0.274	1	0.6004
Gender	0.767	1	0.3809
What is the highest level of education or training that you have successfully completed?	33.979	7	1.738e-05
ISCO_08 1-digit	46.217	9	5.488e-07
Are you working in the private or public sector?	1.976	1	0.1597
Sector of activity – NAICS Rev. 2 – 10 categories	30.084	9	0.0004246
In the past 12 months, how many days were you absent from work due to sick leave or health-related leave?	138.030	5	< 2.2e-16
In the past 12 months, did you work when you were sick?	35.322	2	2.137e-08
How many hours do you usually work per week in your main paid job?	10.769	3	0.01304
How old are you?	106.710	4	< 2.2e-16
Including yourself, can you please tell me how many people live in this household?	34.642	5	1.773e-06
How many working days? [Did you work when you were sick?]	152.620	37	5.494e-16
How many hours does your partner normally work per week, including any paid or unpaid overtime?	41.238	38	0.3309