Health-related Quality of Life and Related Factors in Full-time and Part-time Workers

Original Article

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Background: There has been a rapid increase in the number of part-time workers in Korea with little information available on associated changes in quality of life. This study was designed to compare part-time and full-time workers in terms of the quality of life and related factors.

Methods: Data were extracted from the 4th Korea National Health and Nutrition Examination Survey, conducted in 2008. Of the 1,284 participants selected, 942 were females (range, 20 to 64 years). Based on the information provided by self-administered questionnaire, subjects were categorized according to the working pattern (full-time and part-time) and working hours (<30 and ≥30 hours). Differences in socio-demographic characteristics, health-related behaviors, and job characteristics were assessed by t-test and chi-square test. EuroQol-five dimensions (EQ-5D) index was implemented in order to measure the quality of life. Differences in the EQ-5D index scores between the groups were compared by t-test, stepwise multivariate logistic regression analyses.

Results: Quality of life did not differ by work patterns. In males, the Organization for Economic Cooperation and Development part-time group was associated with poorer quality of life (odds ratio [OR], 0.49; P = 0.028). For both sexes, the non-stress group was linked with superior quality of life in comparison to the stress group (OR, 2.64; P = 0.002; OR, 2.17; P < 0.001). Female employees engaged in non-manual labor had superior quality of life than those engaged in manual labor (OR, 1.40; P = 0.027).

Conclusion: This study concludes that working less than 30 hours per week is related to lower quality of life in comparison to working 30 hours or more in male employees in Korea.

Keywords: Quality of Life; Manpower; Health Surveys; Korea

INTRODUCTION

According to the 2010 annual report from the Organization for Economic Cooperation and Development (OECD), the proportion of part-time workers as a percentage of total employment has increased from 5.2% in 1989 to 9.3% in 2008.[1] Although it is lower than the average proportion of part-time workers of OECD countries, which is 15.5%, the general trend has been for an increase in the proportion of part-time workers, which foretells the possibility of structural change in the Korean

labor market.

Changes in the form of work bring about changes in working hours, family income, and quality of life. Having experienced the economic crisis in 1997 and after the introduction of a five-day work week policy in the Korean labor market in 2000, there have been several reports about the effect of law enforcement on actual working hours, employment, and income but none on the quality of life.[2] Some research has been conducted on the relationship between laborers of specific occupations and the quality of their lives, but without accounting for the working hours.[3,4] There also has not been any study evaluating the relationship between working hours and the quality of life in terms of the general population.

The purpose of this study is to evaluate whether the quality of life differs between full-time workers and part-time workers. The authors used data extracted from the Korea National Health and Nutrition Examination Survey, conducted in 2008, and compared the quality of life of workers, socioeconomic characteristics, health-associated behaviors, and occupational characteristics, and analyzed the effect of type of work on the quality of life.

METHODS

1. Patient Selection

We selected 1,284 workers (342 males, 942 females) aged 20 to 64 years, based on the data extracted from the 4th Korea National Health and Nutrition Examination Survey,[5] conducted in 2008. Part-time workers were smaller in number compared to full-time workers, so we raised statistical reliability by selecting 2 full-time workers per 1 part-time worker.

2. Methods of Measurement

1) Sociodemographic characteristics

Comparisons between the full-time worker group and the part-time worker group in terms of sociodemographic characteristics including sex, age, education, marital status, members of family, income, and residential area were examined. Level of education was divided into elementary school, middle school, high school, and college or more. Marital status was categorized into currently married and currently not married

(divorced, separated, widowed, or single). Residential area was divided into Seoul, 6 metropoles (Busan, Daegu, Incheon, Gwangju, Daejeon, and Ulsan), and elsewhere. Upon multivariate analysis, residential area was divided into 7 metropoles including Seoul and others.

2) Health-associated behaviors

Data were collected using a questionnaire including items concerning the following health-associated behaviors: smoking, alcohol drinking, exercise hours, stress perception, and sleeping duration. Responders answering "yes" on smoking status were classified as smokers, and those drinking alcohol twice or more per week or 5 drinks or more on one occasion were defined as heavy drinkers while those drinking alcohol less than twice per week or less than 5 drinks on one occasion as moderate drinkers. Exercise hours was defined as the sum of time spent performing vigorous or moderate physical activities or walking in one week. Responders answering "stress is very much perceived or much perceived" were classified as stress group and those answering "a little or not so much stress is perceived" were defined as the normal group.

3) Occupation-related factors

Two methods were used to classify participants into full-time and part-time groups. The first method was to conduct a questionnaire with an item concerning type of work. The second method was to classify the participants according to the definition[6] introduced by the OECD in 1997, which stated that part-time work is limited to working less than 30 hours per week, and classify as 30 hours or more and less than 30 hours per week. Occupations were classified according to the Korea Standard Classification of Occupations into manual and non-manual workers. Non-manual workers included managers, professionals and related workers, clerks, service workers, and sales workers. Manual workers included skilled agricultural, forestry and fishery workers, craft and related trades workers, equipment or machine-operating and assembling workers, and elementary workers.

Workplace environment was evaluated by using a questionnaire consisting of the following eight questions extracted from the Korean Occupational Stress Scale[7]: 1) Workplace environment is clean and pleasant, 2) I find my job unsafe and exposed to danger or accidents, 3) I have too much work and feel rushed to finish

Table 1. Baseline characteristics of the study population (n = 1,284).

Variable	Self-administered questionnaire		P-value*	OECD definition		P-value*
	Full-time	Part-time		Over 30 h/wk	Less than 30 h/wk	
Gender						
Male	228 (26.64)	114 (26.64)	1.000	271 (27.48)	71 (23.83)	0.210
Female	628 (73.36)	314 (73.36)		715 (72.52)	227 (76.17)	
Age (y)	45.3 ± 9.7	45.3 ± 9.9	0.984	44.9 ± 9.8	46.6 ± 9.7	0.009
Body mass index (kg/m^2)	23.6 ± 3.2	23.7 ± 3.4	0.542	23.7 ± 3.3	23.6 ± 3.1	0.856
Education						
Elementary	166 (19.39)	84 (19.63)	0.838	186 (18.86)	64 (21.48)	0.274
Middle	126 (14.72)	55 (12.85)		141 (14.30)	40 (13.42)	
High	337 (39.37)	174 (40.65)		405 (41.08)	106 (35.57)	
College	227 (26.52)	115 (26.87)		254 (25.76)	88 (29.53)	
Marital status						
With spouse	741 (86.57)	374 (87.38)	0.683	850 (86.21)	265 (88.93)	0.224
Without spouse	115 (13.43)	54 (12.62)		136 (13.79)	33 (11.07)	
Cohabiting members	3.5 ± 1.4	3.6 ± 1.2	0.415	3.6 ± 1.3	3.6 ± 1.2	0.858
Household income (10,000 won/mo)	329.0 ± 903.5	350.8 ± 1226.0	0.719	323.0 ± 845.5	380.1 ± 1462.2	0.398
Residential district						
Seoul	105 (12.27)	67 (15.65)	<0.001	127 (12.88)	45 (15.10)	0.176
Six metropoles†	168 (19.63)	123 (28.74)		215 (21.81)	76 (25.50)	
Others	583 (68.11)	238 (55.61)		644 (65.31)	177 (59.40)	
Smoking						
None	715 (83.53)	348 (81.31)	0.321	807 (81.85)	256 (85.91)	0.104
Current smoker	141 (16.47)	80 (18.69)		179 (18.15)	42 (14.09)	
Alcohol drinking						
Adequate	734 (85.75)	375 (87.62)	0.357	847 (85.90)	262 (87.92)	0.374
High risk	122 (14.25)	53 (12.38)		139 (14.10)	36 (12.08)	
Stress perception						
None	593 (69.28)	321 (75.00)	0.033	678 (68.76)	236 (79.19)	<0.001
Stress	263 (30.72)	107 (25.00)		308 (31.24)	62 (20.81)	
EQ-5D index	0.91 ± 0.06	0.91 ± 0.07	0.277	0.91 ± 0.07	0.91 ± 0.06	0.282
Male (n = 342)	0.92 ± 0.04	0.92 ± 0.06	0.202	0.93 ± 0.04	0.91 ± 0.07	0.006
Female (n = 942)	0.91 ± 0.07	0.90 ± 0.08	0.517	0.91 ± 0.08	0.91 ± 0.06	0.953
Sleep time (h/d)	6.8 ± 1.2	6.7 ± 1.2	0.765	6.7 ± 1.2	6.7 ± 1.2	0.978
Exercise time (h/wk)	3.0 ± 3.7	2.6 ± 3.2	0.052	3.0 ± 3.8	2.2 ± 2.7	<0.001
Work time (h/wk)	49.8 ± 18.5	29.0 ± 16.5	<0.001	50.5 ± 16.5	17.6 ± 7.1	<0.001
Job class						
Non-manual	480 (56.14)	213 (49.77)	0.031	534 (54.21)	159 (53.36)	0.795
Manual	375 (44.86)	225 (50.23)		451 (45.79)	139 (46.64)	
Work environment						
Non-harmful	118 (13.79)	102 (23.83)	<0.001	134 (13.59)	86 (28.86)	<0.001
Harmful	738 (86.21)	326 (76.17)		859 (86.41)	212 (71.14)	

Values are presented as number (%) or mean ± SD.

OECD: Organization for Economic Cooperation and Development, EQ-5D: EuroQOL-five dimensions.

*Calculated by Student t-test or chi square test. †Six metropoles consist of Busan, Daegu, Incheon, Gwangju, Daejeon, and Ulsan.

by deadlines, 4) I have control over my work duties and work time, 5) I receive appropriate recognition or respect for good performance, 6) My work involves working for long periods of time in uncomfortable postures, 7) My work involves lifting or carrying heavy objects, and 8) I have to work hiding my feelings. Respondents answering negatively to any of the above statements were classified as the harmful group, and those answering none of the questions negatively were defined as the non-harmful group.

4) Health-related quality of life

EuroQol-five dimensions (EQ-5D) index was implemented in this study to evaluate the health-related quality of life. EQ-5D was developed in 1987 by the members of the EuroQol group to measure the quality of life of the general population.[8] The EQ-5D questionnaire comprises the following 5 dimensions: mobility, self-care, usual activity, pain/disability, and anxiety/depression. Each dimension has 3 levels: no problems, some problems, extreme problems, and the responders choose the level that best describes the current health condition. The score is then converted into an index. Korea valuation studies were conducted in 2007 to develop a new version of the index,[9] thus the Korea National Health and Nutrition Examination Survey of 2008 implemented the EQ-5D index using the Korean preference weights to evaluate the quality of life.

3. Statistical Analysis

After classifying participants into part-time and full-time groups, univariate analyses were conducted to assess the difference in terms of socio-demographic characteristics, health-associated behaviors, and occupational characteristics. The same analyses were conducted after classifying the groups further into those working 30 hours or more and those working less than 30 hours. From the univariate logistic regression analysis, the variables that had a P-value < 0.1 were selected as variables in the logistic regression done as a second phase analysis with the dependent variable as the EQ-5D index. Stepwise logistic regression was also performed by sex. Each variable was classified by the median score except for work duration which was classified by 30 hours. Preference weights of EQ-5D index were applied, and the index scores were classified by the median score, 0.95. For model 1 in which the EQ-5D was the dependent variable and type and duration of work were independent variables, analysis was

conducted after adjusting for age. Personal characteristics were additionally included in model 2, and in model 3 occupational characteristics were also included for analysis. All analyses were done using Stata ver. 10.0 (Stata Co., College Station, TX, USA), and an alpha level of 0.05 was considered statistically significant.

Table 2. Multivariate logistic regression of EQ-5D class in total subjects (n = 1,284).

Variable	Odds ratio (95% CI)	P-value*
Gender		
Male	1	<0.001
Female	0.50 (0.38−0.68)	
Age (y)		
>44	1	<0.001
≤44	2.44 (1.88−3.16)	
Residential district		
Metropolis	1	0.697
Others	0.95 (0.73−1.22)	
Stress perception		
Stress	1	<0.001
Normal	2.34 (1.79−3.06)	
Exercise time (h/wk)		
<1	1	0.462
≥1	1.10 (0.85−1.42)	
Work type		
Full-time	1	0.410
Part-time	0.88 (0.65−1.18)	
Work time (h/wk)		
≥30	1	0.358
<30	0.85 (0.61−1.19)	
Job class		
Manual	1	0.038
Non-manual	1.32 (1.01−1.71)	
Work environment		
Harmful	1	0.071
Non-harmful	1.38 (0.97−1.95)	

Continuous variable were divided by median except work time.
EQ-5D: EuroQoL-five dimensions, CI: confidence interval.
*P-value by logistic regression analysis after adjusting with all above variables.

RESULTS

1. Baseline Characteristics of Participants

Of the 1,284 participants, 342 (26.6%) were men, and 942 (73.4%) were women. In comparison of full-time to part-time groups, there were no significant differences in baseline characteristics including age, body mass index (BMI), level of education, marital status, number of household members, family income, smoking, alcohol drinking, EQ-5D index, hours of sleep, and exercise hours, however statistically significant differences were demonstrated in residential area, perception of stress, working hours, classification of occupation, and working environment. In comparison of the group of workers working 30 hours or more to that of workers working less than 30 hours, variables including age, stress perception, exercise hours, working hours, and workplace environment were found to be significantly different. There also was a significant difference in EQ-5D index only in males (Table 1).

2. Health-related Quality of Life

As a result of analyzing health-related quality of life, quality of life was found to be 2.44 times better in participants younger than 44 years old (P < 0.001), 2.34 times better in the group without stress (P < 0.001), and 1.32 times better in non-manual workers in comparison to manual workers (P = 0.038). There was no statistical significance when comparing the quality of life by type or hours of work (Table 2).

Stepwise multivariate analyses were performed in terms of sex. In model 1, where age was adjusted only for men, there was no significant difference in quality of life in terms of type or hours of work. However, in model 2, where residential area, stress perception, and exercise duration were adjusted, and model 3, where classification of occupation and working environment were further adjusted, those working less than 30 hours were found to have 0.49 times (P = 0.031, P = 0.028) worse quality of life in comparison to those working 30 hours or more (Table 3). Identical models were applied to females, but no statistical difference was demonstrated concerning the type or hours of work (Table 4).

For both sexes, the group without stress was found to be building at least twice better health-related quality of life compared to those perceiving stress (odds ratio [OR], 2.64; P = 0.002; OR, 2.29; P < 0.001). In females, non-manual laborers were found to have 1.4 times (P = 0.027) better quality of life (Tables 3, 4).

Table 3. Stepwise multivariate logistic regression model of EQ-5D index in men.

Variable	Model 1*		Model 2[†]		Model 3[‡]	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Work type	0.92 (0.52−1.61)	0.773	1.03 (0.57−1.86)	0.911	1.06 (0.58−1.94)	0.835
Work time	0.54 (0.29−1.00)	0.050	0.49 (0.26−0.93)	0.031	0.49 (0.26−0.92)	0.028
Age	2.82 (1.61−4.91)	<0.001	3.02 (1.67−5.45)	<0.001	2.94 (1.62−5.34)	<0.001
Residential district			0.57 (0.32−1.00)	0.053	0.57 (0.32−1.01)	0.055
Stress perception			2.58 (1.41−4.72)	0.002	2.64 (1.43−4.88)	0.002
Exercise time			1.59 (0.89−2.87)	0.116	1.61 (0.89−2.90)	0.112
Job class					1.21 (0.69−2.12)	0.498
Work environment					0.99 (0.46−2.12)	0.998

Each binary variables were assigned number '0' or '1' for logistic regression. Work type (0: full-time, 1: part-time); work time (0: ≥30 hours, 1: <30 hours); age (0: >44 year, 1: ≤44 year); residential district (0: others, 1: metropolis); stress perception (0: stress, 1: normal); exercise time (0: <1 hour, 1: ≥1 hour); job class (0: manual, 1: non-manual); work environment (0: harmful, 1: non-harmful); EQ-5D (weighted value, 0: <0.95, 1: ≥0.95).

EQ-5D: EuroQoL-five dimensions, OR: odds ratio, CI: confidence interval.

*Adjusted by age. [†]Adjusted by age, residential district, stress perception, exercise time. [‡]Adjusted by age, residential district, stress perception, exercise time, job class, and work environment.

Table 4. Stepwise multivariate logistic regression model of EQ-5D index in women.

Variable	Model 1*		Model 2†		Model 3‡	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Work type	0.83 (0.60−1.17)	0.300	0.82 (0.58−1.15)	0.263	0.82 (0.58−1.16)	0.274
Work time	1.21 (0.83−1.75)	0.306	1.10 (0.75−1.61)	0.605	1.05 (0.71−1.54)	0.799
Age	2.34 (1.79−3.05)	<0.001	2.52 (1.91−3.32)	<0.001	2.17 (1.61−2.92)	<0.001
Residential district			1.11 (0.84−1.48)	0.439	1.08 (0.81−1.44)	0.579
Stress perception			2.34 (1.74−3.14)	<0.001	2.29 (1.70−3.09)	<0.001
Exercise time			1.00 (0.75−1.33)	0.984	1.02 (0.76−1.36)	0.863
Job class					1.40 (1.04−1.90)	0.027
Work environment					1.47 (0.99−2.19)	0.055

Each binary variables were assigned number '0' or '1' for logistic regression. Work type (0: full-time, 1: part-time); work time (0: ≥30 hours, 1: <30 hours); age (0: >44 year, 1: ≤44 year); residential district (0: others, 1: metropolis); stress perception (0: stress, 1: normal); exercise time (0: <1 hour, 1: ≥1 hour); job class (0: manual, 1: non-manual); work environment (0: harmful, 1: non-harmful); EQ-5D (weighted value, 0: <0.95, 1: ≥0.95).

EQ-5D: EuroQoL-five dimensions, OR: odds ratio, CI: confidence interval.

*Adjusted by age. †Adjusted by age, residential district, stress perception, exercise time. ‡Adjusted by age, residential district, stress perception, exercise time, job class, and work environment.

DISCUSSION

The current study used the working hours indicated by the 2008 Korea National Health and Nutrition Examination Survey and EQ-5D index to compare the quality of lives of full-time workers and part-time workers and demonstrated that male laborers working less than 30 hours a week had lower quality of life.

The International Labour Organization defined part-time as a form of employment that carries considerably fewer hours of work per week than a full-time job. The above definition is applicable on an individual basis but not for family income and expenditure survey, and for such purposes, it is more suitable to have the participant answer whether or not he or she is a part-time worker or divide the types of work by a country-specific work duration. Van Bastelaer et al.[6] emphasized the importance of developing a common index for an international applicability. In 1997, the OECD decided to define part-time employment as a form of employment that carries less than 30 hours of work per week.[6] Thus the current study analysed health-related quality of life and other associated factors by not only implementing a self-reported questionnaire to categorize the participants into part-time and full-time workers, but also by dividing the participants

working the same or more or less than the part-time hours defined by the OECD. The EQ-5D index, which is one of the frequently used tools to evaluate health-related quality of life, received Korean linguistic translation verification and approval of its efficacy in Korean.[9,10] Application of such a verified tool is considered to be an important factor in determining objectivity and reliability in evaluating one's quality of life.[11]

Although UK preference weights of the EQ-5D were developed in the UK, further valuation studies were conducted in the US, Japan, Zimbabwe, and other countries, to elicit country-specific weights derived from samples of the general population.[12-14] In 2007, Korea also conducted a valuation study to elicit a country-specific weight,[10] and the present study utilized the resultant preference weighted EQ-5D index.

Analyses of all study populations were conducted to show that male participants had lower quality of life than female participants which is similar to the results reported by the Beaver Dam Health Outcome Study.[15] Of the various health-associated behaviors, perception of stress was found to have a significant effect on quality of life. Also in a Swedish study, the EQ-5D index was used to demonstrate that psychological stress was related to lower health-related quality of life.[16] Despite the statistical insignificance in the current study, in other studies, non-smokers

had better quality of life,[17] and heavy alcohol drinkers had lower quality of life.[18]

In the analysis by sex, there was no statistical significance in terms of type of employment, but upon dividing the groups by working hours, those working less than 30 hours were found to have lower quality of life. The reason for such a result may be that, of part-time workers, those working 30 hours or more may have higher self-esteem due to the higher income and steady work. In Korea, laborers can be further broken down into regular workers and temporary workers. By hourly rate, temporary workers would earn similar amount of income as regular workers but receive less welfare benefits, possibly leading to lower quality of lives. However the present study demonstrated that besides the economic issue, working in a steady manner may have an effect on one's self-esteem as well. In females, there was no difference shown by working hours but by type of work; non-manual female workers had better quality of lives. According to the European Community Household Panel Survey, which ran from 1994 to 2001, 45% of females of the European Union preferred part-time jobs because of home management and child-raising issues,[19] and the reason for women becoming economically active was to help with rather than to fully support a household income unlike most male workers. The reason that the difference in quality of life by working hours was only shown in men may be related to the difference in the reason for economic participation.

According to a study of 1,870 workers of a major company on the relationship between type of work and work-related stress, production workers were prone to higher amount of work-related stress.[20] On the other hand, Chon et al.[21] reported that temporary workers suffer from higher amount of work-related stress than regular workers. Due to the higher proportion of manual laborers among production workers and temporary workers, in line with the study by Burstrom et al.,[16] the higher amount of work-related stress may play a major role in lowering the quality of life.

Our study has a couple of limitations. First, as a cross-sectional study, we could not assess the temporal relationship between the quality of life and the baseline and health-related characteristics of the participants. Second, the amount of stress was only subjectively evaluated rather than by using objective tools. Despite such limitations, this study not only used data from the Korea National Health and Nutrition Examination Survey,

a nationwide representative data, but also the definition of part-time job indicated by the OECD and the EQ-5D index with preference weights specific to the Korean population.

In summary, this cross-sectional study suggests that the quality of lives of male laborers working less than 30 hours a week and female workers involved in manual labor have lower quality of lives. There is a need for further studies on quality of life in various fields, and the resultant data should be reflected in drafting welfare-related policies concerning better quality of life.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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