

Opinion



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Statement by the Korean Society of Occupational and Environmental Medicine on the proposed reform of working hours in South Korea

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ABSTRACT

The current 52-hour workweek in South Korea consists of 40 hours of regular work and 12 hours of overtime. Although the average working hours in South Korea is declining, it is still 199 hours longer than the Organisation for Economic Co-operation and Development average of 1,716 hours per year. In view to this, the South Korean government has now proposed to reform the workweek, mainly intending to increase the workweek to 69 hours when the workload is heavy. This reform, by increasing the labor intensity due to long working hours, goes against the global trend of reducing work hours for a safe and healthy working environment. Long working hours can lead to increased cerebrovascular and cardiovascular diseases, industrial accidents, mental health problems, and safety accidents due to lack of concentration. In conclusion, the Korean government's working hour reform plan can have a negative impact on workers' health, and therefore it should be thoroughly reviewed and modified.

Keywords: Work; Cardiovascular diseases; Cerebrovascular diseases; Sleep; Mental health; Accidents

The South Korean government has announced a plan to reorganize the working hours of employees to up to 69 hours per week when they have heavy workload. As of May 2023, overtime can be extended by only one week at a time. The current maximum workweek is 52 hours; this includes 40 hours of regular work and 12 hours of overtime. The government's revised plan allows for extending overtime hours by monthly, quarterly, semi-annual, and annual

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Abbreviations

CI: confidence interval; HR: hazard ratio; ILO: International Labor Organization; OECD: Organisation for Economic Co-operation and Development; OR: odds ratio; RR: relative risk; WHO: World Health Organization.

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Competing interests

The authors declare that they have no competing interests.

Author Contributions

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periods, besides the one-week period that can be settled by labor-management agreements. The maximum working hours allowed to be extended per week is 69, guaranteeing 11 hours of work per day, 30-minute breaks every 4 hours, and one day of paid vacation per week.

However, considering the opposition of the labor force, academia, and the media to the reform, South Korean President Yoon Suk Yeol has ordered to consider a maximum workweek of 60 hours; this alternative too allows for long hours when unavoidable at certain times of the year. The average annual workweek in South Korea has declined from 2,163 hours in 2010 to 1,915 hours in 2021, but it is still 199 hours higher than the Organisation for Economic Co-operation and Development (OECD) average of 1,716 hours (Fig. 1).¹ Government reforms can lead to increased labor intensity due to long working hours. The global trend is to reduce working hours and to promote safe and healthy working conditions as a fundamental right; this is outlined by the International Labor Organization (ILO). However, South Korea is moving in the opposite direction. The current state of the working hour regulations of major countries shows that Korea has relatively long working hours (Table 1).^{2,7}

As regards health issues, the government’s plan to reorganize working hours can significantly increase the occupational accidents related to cerebrovascular disease, as suggested by the Korean work-related cerebro-cardiovascular disease criteria. The current standard for determining occupational cerebrovascular disease follows three criteria: first, a sudden event or change in work environment; second, work burden for a short period; and third, chronic overwork. The government plans to reorganize work hours can increase the number of occupational accidents related to cerebrovascular disease, as suggested by these three criteria. Currently, the Korean Industrial Accident Compensation Insurance Act and its subordinate laws consider the following as “workload aggravating factors”: working exceeding 60 hours per week on average (64 hours per week on average for 4 weeks prior to onset) during the 12 weeks prior to onset; working exceeding 52 hours per week on average during the 12 weeks preceding the onset, especially when the work falls under any of the following categories: unpredictable schedules, shift work, lack of holidays, exposure to harmful environments (cold, temperature change, noise), high physical intensity, frequent business trips involving large time differences, and high mental strain.⁸ For compensation purposes, the 69-hour maximum workweek proposed can conflict with the existing worker compensation laws as longer work hours are associated with higher risk of cerebrovascular or heart disease in the cases mentioned above.

In 2016, the World Health Organization (WHO) and ILO found that 8.9% of the world’s population were exposed to long work hours (55 hours or more). They also attributed 3.7%

Table 1. Labor hour regulations in major countries

Country (year of amendment of the statute)	Statutory normal daily working hours	Statutory normal weekly working hours	Additional information regarding working hours
Korea (2018)	8 hours	40 hours	Statutory limit on maximum weekly hours (including overtime) are 52 hours.
Germany (2020)	8 hours (with a maximum of 2 additional hours)	40 hours	Adjustments are made to ensure that the average daily working hours do not exceed 8 hours within a 6-month or 24-week period.
France (2000)	No statutory provisions (maximum daily working hours is 10)	35 hours (maximum weekly working hours limited to 48)	The average working hours over a period of 12 weeks cannot exceed 44. Statutory limit on maximum yearly hours (including overtime) is 1,600.
United Kingdom (2019)	8 hours	40 hours (maximum working hours per week are 48 hours)	Working beyond 48 hours per week is allowed, but the UK government has not set legal limits for overtime work and pay. These are determined by agreements between employers and employees.
Japan (2018)	8 hours	40 hours	Statutory limits on overtime: 45 hours per month, and 360 hours per year.

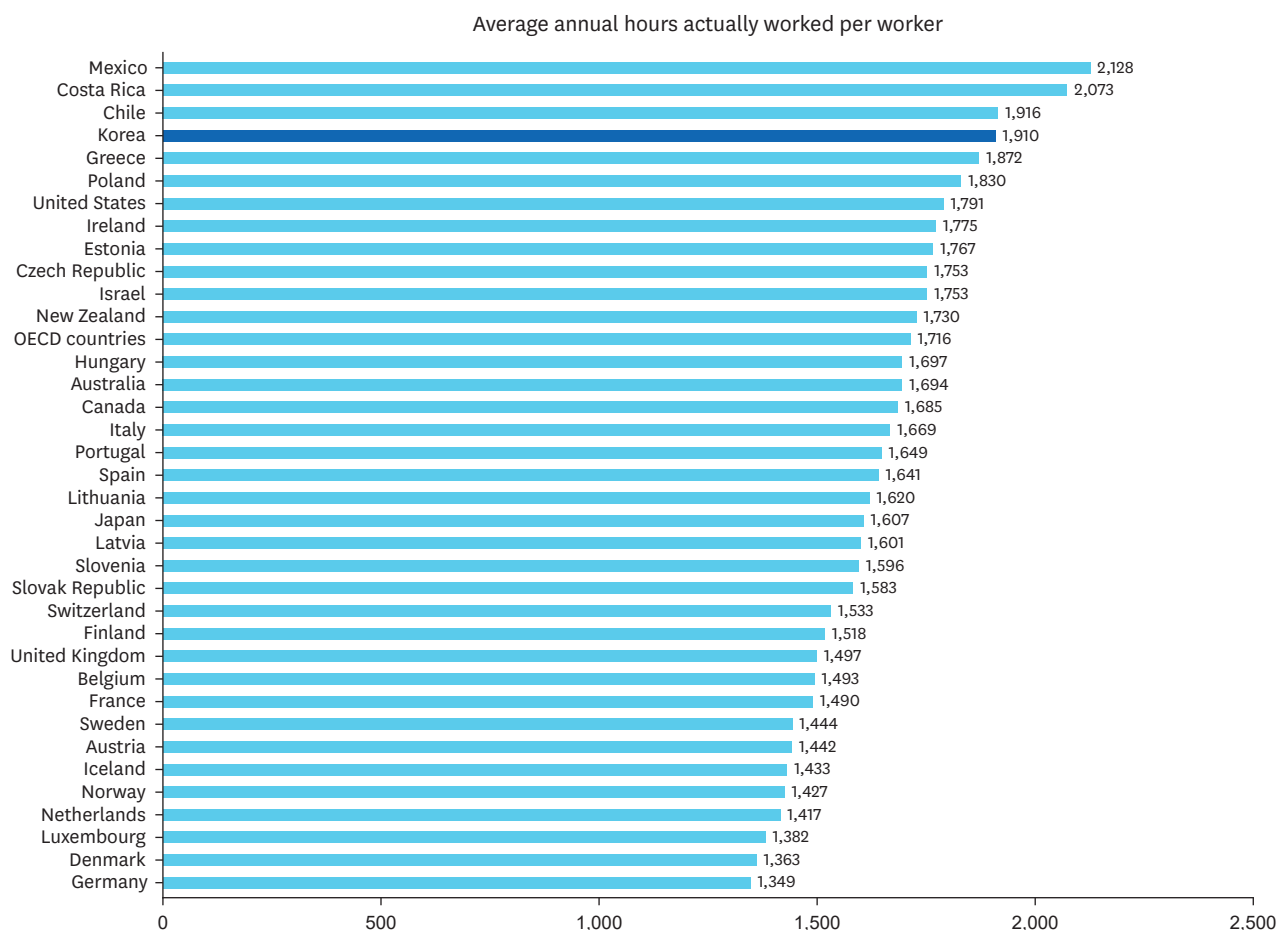


Fig. 1. Average annual hours worked by OECD countries in 2021.

of the ischemic heart disease deaths and 6.9% of the stroke deaths to long work hours.⁹ In a case-crossover study, Shin et al. found a 1.45-fold increase in risk of cerebrovascular disease for a 10-hour increase in average weekly work hours in the most recent week compared with the average weekly work hours over a three-month period.¹⁰ In an analysis of 42 cohort studies, including 36 unpublished studies from the IPD-work consortium, stroke incidence was 1.27 times higher for working 49–54 hours per week and 1.33 times higher for working 55 or more hours per week compared to working 35–40 hours per week.¹¹ In a meta-analysis of 22 cohort studies involving 339,680 participants, Li et al.¹² found that working more than 55 hours per week was associated with a 1.13-fold increased risk of ischemic heart disease compared to working 35–40 hours per week. Descatha et al.¹³ conducted a meta-analysis of 162,644 participants from 7 cohort studies, to find that working 55 hours or more per week was associated with a 1.35-fold increased risk of stroke compared to working 35–40 hours per week (Table 2).¹³

Policy changes in work hours can have a negative impact on workers' health conditions other than cerebrovascular diseases too. Working long hours can negatively affect the mental health of workers, leading to sleep disorders, depression, anxiety, and suicidal thoughts. In a study of the Whitehall II cohort, Virtanen et al.¹⁴ reported a 3.24-fold decrease in sleep duration, a 6.66-fold increase in difficulty falling asleep, and a 2.23-fold increase in early morning awakening among those working 55 hours per week compared with those working

Table 2. Long working hours and cerebro-cardiovascular disease

Reference	Year	Study design	Exposure (working hours)	Outcome	Risk estimate (95% CI)
Shin et al. [10]	2017	Case-crossover study	10-hour increase in average weekly working hours	Cerebro-cardiovascular disease (incidence)	OR: 1.45 (1.22–1.72)
Kivimäki et al. [11]	2015	Meta-analysis	≥ 55 hr/week vs. 35–40 hr/week	Ischemic heart disease (mortality) Stroke (incidence)	RR: 1.08 (0.94–1.23) RR: 1.33 (1.11–1.61)
Li et al. [12]	2020	Meta-analysis	≥ 55 hr/week vs. 35–40 hr/week	Ischemic heart disease (incidence) Ischemic heart disease (mortality)	RR: 1.13 (1.02–1.26) RR: 1.17 (1.05–1.31)
Descatha et al. [13]	2020	Meta-analysis	≥ 55 hr/week vs. 35–40 hr/week	Stroke (incidence) Stroke (mortality)	RR: 1.35 (1.13–1.61) RR: 1.08 (0.89–1.31)

CI: confidence interval; OR: odds ratio; RR: relative risk.

35–40 hours per week, suggesting the association between long workweek and sleep. In another cohort study, full-time workers aged 44–66 years working 55 hours or more a week showed a 1.66-fold increase in depressive symptoms and a 1.74-fold increase in anxiety symptoms compared to those working 35–40 hours per week.¹⁵ In a study of 4,539 full-time participants of the 2007–2009 Korean National Health and Nutrition Examination Survey, Kim et al.¹⁶ found a 1.38-fold increase in suicidal ideation among those who worked 60 hours or more per week compared with those who worked 40–51 hours per week. Numerous studies have found long work hours associated with poor sleep and mental illness (Table 3).^{17–21}

Additionally, longer work hours increased the risk of accidents due to decreased worker concentration. A systematic review by Wagstaff et al. found a consistent 1.32- to 1.98-fold

Table 3. Long working hours and sleep/mental health

Reference	Year	Study design	Exposure (working hours)	Outcome	Risk estimate (95% CI)
Virtanen et al. [14]	2009	Cohort study	≥ 55 hr/week vs. 35–40 hr/week	Shortened sleep	OR: 3.24 (1.45–7.27)
				Difficulty falling asleep	OR: 6.66 (2.64–16.83)
				Early morning awakening	OR: 2.23 (1.16–4.31)
Virtanen et al. [15]	2009	Cohort study	≥ 55 hr/week vs. 35–40 hr/week	Depressive symptom	HR: 1.66 (1.06–2.61)
				Anxiety symptom	HR: 1.74 (1.15–2.61)
Kleppa et al. [17]	2008	Cross-sectional study	49–100 hr/week vs. 35–40 hr/week (men) 41–100 hr/week vs. 32–40 hr/week (women)	Anxiety caseness	OR: 1.67 (1.36–2.06)
				Depression caseness	OR: 1.50 (1.17–1.93)
				Anxiety caseness	OR: 1.44 (1.06–1.95)
Kim et al. [18]	2013	Cross-sectional study	≥ 60 hr/week vs. <52 hr/week	Depression caseness	OR: 1.61 (1.06–2.45)
				Depressive symptom	OR: 1.62 (1.20–2.18)
Choi et al. [19]	2021	Cross-sectional study	≥ 69 hr/week vs. 40 hr/week	Depression (moderate to severe)	OR: 2.05 (1.22–3.42)
				Suicidal ideation	OR: 1.93 (1.22–3.06)
Park et al. [20]	2020	Cross-sectional study	> 60 hr/week vs. 31–40 hr/week	High stress level	OR: 2.55 (1.67–3.62)
				Depression	OR: 4.09 (1.59–10.55)
				Suicidal ideation	OR: 5.30 (1.61–17.42)
Kim et al. [16]	2012	Cross-sectional study	≥ 60 hr/week vs. 40–51 hr/week	Suicidal ideation	OR: 1.38 (p-value 0.02)
Lee et al. [21]	2020	Cohort study	45–52 hr/week vs. 35–44 hr/week > 52 hr/week vs. 35–44 hr/week	Suicide	HR: 3.89 (1.06–14.29)
					HR: 3.74 (1.03–13.64)

CI: confidence interval; OR: odds ratio; HR: hazard ratio.

Table 4. Long work hours and accidents

Reference	Year	Study design	Exposure (working hours)	Outcome	Risk estimate (95% CI)
Dembe et al. [23]	2005	Cohort study	Overtime (yes vs. no)	Injuries or illnesses	HR: 1.61 (1.22–1.72)
			Extended hours/week ≥ 60 (yes vs. no)		HR: 1.23 (1.05–1.45)
			Extended hours/day ≥ 12 (yes vs. no)		HR: 1.37 (1.16–1.59)
Vegso et al. [24]	2007	Case-crossover study	> 64 hr/week vs. ≤ 40 hr/week	Occupational injury	HR: 1.88 (1.16–3.05)
Barger et al. [25]	2005	Case-crossover study	Extended work shifts ≥ 24 hr (yes vs. no)	Motor vehicle crashes	OR: 2.3 (1.6–3.3)
Fransen et al. [26]	2006	Cross-sectional study	> 40 hr/week vs. ≤ 40 hr/week	Work injury	RR: 1.32 (1.12–1.55)
Dong [27]	2005	Cross-sectional study	> 50 hr/week vs. ≤ 50 hr/week	Severe work-related injuries	OR: 1.98 (1.88–2.05)
Lee et al. [28]	2014	Cross-sectional study	≥ 52 hr/week vs. < 52 hr/week (company)	Industrial accidents	OR: 2.29 (1.08–4.87)

CI: confidence interval; HR: hazard ratio; OR: odds ratio; RR: relative risk.

increase in risk of occupational accidents in four studies on working more than 8 hours per day and a consistent 1.37- to 3.29-fold increase in four studies on working more than 12 hours per day (Table 4).²²⁻²⁸

From the above findings, a work time reform plan that increases working hours can have a negative impact on worker health. Therefore, the government's working hour reform plan should be thoroughly reviewed and modified.

SUPPLEMENTARY MATERIAL

Supplementary Data 1

Statement by the Korean Society of Occupational and Environmental Medicine on the proposed reform of working hours in South Korea (Korean)

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REFERENCES

1. OECD.Stat. <https://stats.oecd.org>. Updated 2023. Accessed May 15, 2023.
2. OECD employment outlook 2021. https://www.oecd-ilibrary.org/employment/oecd-employment-outlook-2021_5a700c4b-en. Updated 2021. Accessed May 15, 2023.
3. Labor Standards Act. <https://law.go.kr/LSW/lsInfoP.do?lsiSeq=199151&viewCls=engLsInfoR&urlMode=engLsInfoR#0000>. Updated 2018. Accessed May 15, 2023.
4. Arbeitszeitgesetz (ArbZG). <https://www.gesetze-im-internet.de/arbzgj/BJNR117100994.html#BJNR-117100994BJNG000200307>. Updated 2021. Accessed May 15, 2023.
5. Code du travail. https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006072050?etatTexte=VIGUEUR&etatTexte=VIGUEUR_DIFF. Updated 2021. Accessed May 15, 2023.
6. The Working Time Regulations 1998. <https://www.legislation.gov.uk/uksi/1998/1833/part/II>. Updated 2019. Accessed May 15, 2023.
7. Labor Standards Act. <https://elaws.e-gov.go.jp/document?lawid=322AC0000000049>. Updated 2021. Accessed May 15, 2023.
8. Ministry of Employment and Labor Notice 2022-40. Matters necessary to determine whether cerebrovascular disease or heart disease and musculoskeletal disease are recognized as occupational diseases. <https://law.go.kr/LSW/admRulInfoP.do?admRulSeq=2100000211032>. Updated 2022. Accessed June 16, 2023.
9. Pega F, Náfrádi B, Momen NC, Ujita Y, Streicher KN, Prüss-Üstün AM, et al. Global, regional, and national burdens of ischemic heart disease and stroke attributable to exposure to long working hours for 194 countries, 2000-2016: a systematic analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury. *Environ Int* 2021;154:106595.
[PUBMED](#) | [CROSSREF](#)
10. Shin KS, Chung YK, Kwon YJ, Son JS, Lee SH. The effect of long working hours on cerebrovascular and cardiovascular disease; a case-crossover study. *Am J Ind Med* 2017;60(9):753-61.
[PUBMED](#) | [CROSSREF](#)
11. Kivimäki M, Virtanen M, Nyberg ST, Batty GD. The WHO/ILO report on long working hours and ischaemic heart disease - conclusions are not supported by the evidence. *Environ Int* 2020;144:106048.
[PUBMED](#) | [CROSSREF](#)
12. Li J, Pega F, Ujita Y, Brisson C, Clays E, Descatha A, et al. The effect of exposure to long working hours on ischaemic heart disease: a systematic review and meta-analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury. *Environ Int* 2020;142:105739.
[PUBMED](#) | [CROSSREF](#)
13. Descatha A, Sembajwe G, Pega F, Ujita Y, Baer M, Boccuni F, et al. The effect of exposure to long working hours on stroke: a systematic review and meta-analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury. *Environ Int* 2020;142:105746.
[PUBMED](#) | [CROSSREF](#)

14. Virtanen M, Ferrie JE, Gimeno D, Vahtera J, Elovainio M, Singh-Manoux A, et al. Long working hours and sleep disturbances: the Whitehall II prospective cohort study. *Sleep* 2009;32(6):737-45.
[PUBMED](#) | [CROSSREF](#)
15. Virtanen M, Ferrie JE, Singh-Manoux A, Shipley MJ, Stansfeld SA, Marmot MG, et al. Long working hours and symptoms of anxiety and depression: a 5-year follow-up of the Whitehall II study. *Psychol Med* 2011;41(12):2485-94.
[PUBMED](#) | [CROSSREF](#)
16. Kim KU, Park SG, Kim HC, Lim JH, Lee SJ, Jeon SH, et al. Association between long working hours and suicidal ideation. *Korean J Occup Environ Med* 2012;24(4):339-46.
[CROSSREF](#)
17. Kleppa E, Sanne B, Tell GS. Working overtime is associated with anxiety and depression: the Hordaland Health Study. *J Occup Environ Med* 2008;50(6):658-66.
[PUBMED](#) | [CROSSREF](#)
18. Kim I, Kim H, Lim S, Lee M, Bahk J, June KJ, et al. Working hours and depressive symptomatology among full-time employees: results from the fourth Korean National Health and Nutrition Examination Survey (2007-2009). *Scand J Work Environ Health* 2013;39(5):515-20.
[PUBMED](#) | [CROSSREF](#)
19. Choi E, Choi KW, Jeong HG, Lee MS, Ko YH, Han C, et al. Long working hours and depressive symptoms: moderation by gender, income, and job status. *J Affect Disord* 2021;286:99-107.
[PUBMED](#) | [CROSSREF](#)
20. Park S, Kook H, Seok H, Lee JH, Lim D, Cho DH, et al. The negative impact of long working hours on mental health in young Korean workers. *PLoS One* 2020;15(8):e0236931.
[PUBMED](#) | [CROSSREF](#)
21. Lee HE, Kim I, Kim HR, Kawachi I. Association of long working hours with accidents and suicide mortality in Korea. *Scand J Work Environ Health* 2020;46(5):480-7.
[PUBMED](#) | [CROSSREF](#)
22. Wagstaff AS, Sigstad Lie JA. Shift and night work and long working hours--a systematic review of safety implications. *Scand J Work Environ Health* 2011;37(3):173-85.
[PUBMED](#) | [CROSSREF](#)
23. Dembe AE, Erickson JB, Delbos RG, Banks SM. The impact of overtime and long work hours on occupational injuries and illnesses: new evidence from the United States. *Occup Environ Med* 2005;62(9):588-97.
[PUBMED](#) | [CROSSREF](#)
24. Vegso S, Cantley L, Slade M, Taiwo O, Sircar K, Rabinowitz P, et al. Extended work hours and risk of acute occupational injury: a case-crossover study of workers in manufacturing. *Am J Ind Med* 2007;50(8):597-603.
[PUBMED](#) | [CROSSREF](#)
25. Barger LK, Cade BE, Ayas NT, Cronin JW, Rosner B, Speizer FE, et al. Extended work shifts and the risk of motor vehicle crashes among interns. *N Engl J Med* 2005;352(2):125-34.
[PUBMED](#) | [CROSSREF](#)
26. Fransen M, Wilsmore B, Winstanley J, Woodward M, Grunstein R, Ameratunga S, et al. Shift work and work injury in the New Zealand Blood Donors' Health Study. *Occup Environ Med* 2006;63(5):352-8.
[PUBMED](#) | [CROSSREF](#)
27. Dong X. Long workhours, work scheduling and work-related injuries among construction workers in the United States. *Scand J Work Environ Health* 2005;31(5):329-35.
[PUBMED](#) | [CROSSREF](#)
28. Lee JY, Choi E, Lim SH, Kim HA, Jung HS. The relationship between long working hours and industrial accident. *Korean J Occup Health Nurs* 2014;23(1):39-46.
[CROSSREF](#)