

Differential impact of working hours on unmet medical needs by income level: a longitudinal study of Korean workers¹

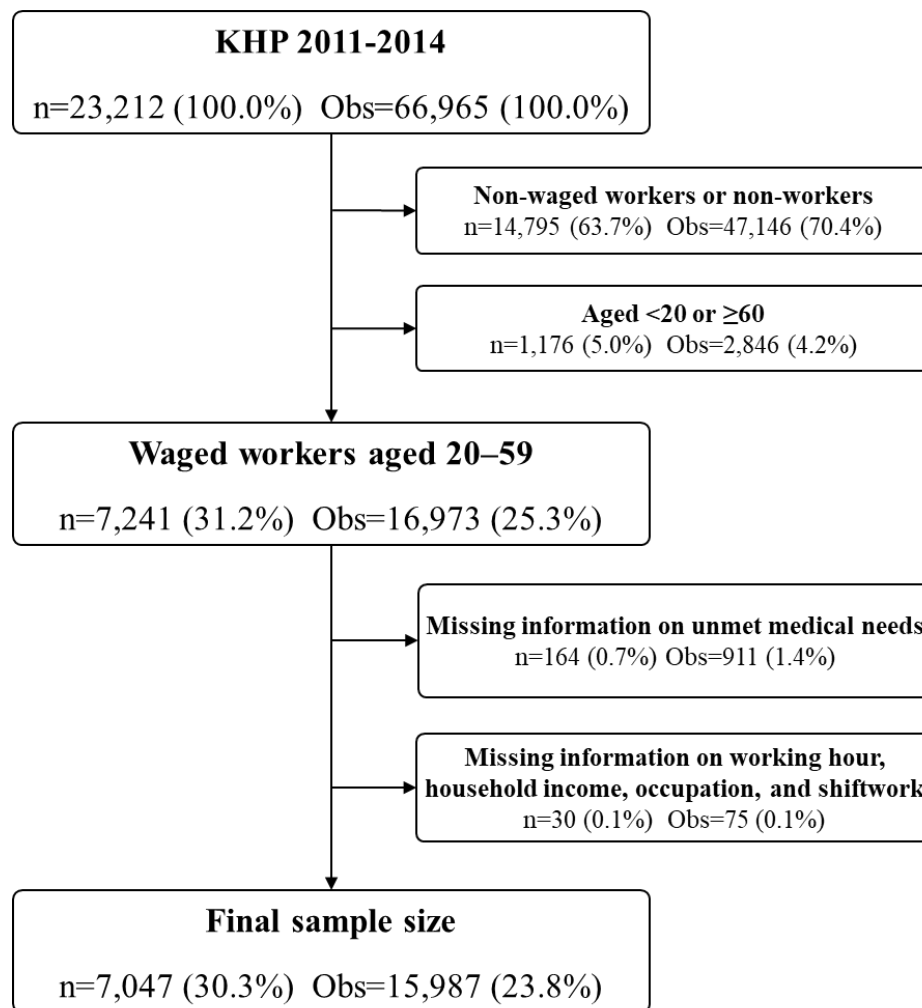
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1. *Supplementary material*

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Supplementary Figure S1. Depicts of the study population



Supplementary Table S1. Demographic characteristics of the included participants and excluded participants

	2011		2012		2013		2014	
	Included n (%)	Excluded n (%)	Included n (%)	Excluded n (%)	Included n (%)	Excluded n (%)	Included n (%)	Excluded n (%)
<i>Gender</i>								
Male	2,216 (55.9)	6,085 (46.6)	2,119 (55.6)	5,590 (46.4)	1,966 (55.4)	5,215 (46.2)	2,590 (55.6)	6696 (46)
Female	1,749 (44.1)	6,985 (53.4)	1,692 (44.4)	6,471 (53.7)	1,585 (44.6)	6,073 (53.8)	2,070 (44.4)	7863 (54)
<i>Age</i>								
<20		4,044 (30.9)		3,585 (29.7)		3,260 (28.9)		4107 (28.2)
20-29	522 (13.2)	1,204 (9.2)	518 (13.6)	1,144 (9.5)	480 (13.5)	987 (8.7)	590 (12.7)	1328 (9.1)
30-39	1,121 (28.3)	1,112 (8.5)	1,027 (27)	909 (7.5)	921 (25.9)	802 (7.1)	1,184 (25.4)	942 (6.5)
40-49	1,402 (35.4)	1,377 (10.5)	1,374 (36.1)	1,239 (10.3)	1,284 (36.2)	1,165 (10.3)	1,664 (35.7)	1471 (10.1)
50-59	920 (23.2)	1,360 (10.4)	892 (23.4)	1,238 (10.3)	866 (24.4)	1,149 (10.2)	1,222 (26.2)	1475 (10.1)
≥60		3,973 (30.4)		3,946 (32.7)		3,925 (34.8)		5236 (36)
<i>Employment status</i>								
Waged workers	3,965 (100)	953 (7.3)	3,811 (100)	855 (7.1)	3,551 (100)	867 (7.7)	4,660 (100)	1157 (8)
Employer or self-employer		2,076 (15.9)		1,943 (16.1)		1,858 (16.5)		2402 (16.5)
Non-waged workers		571 (4.4)		540 (4.5)		507 (4.5)		653 (4.5)
Non-workers		5,118 (39.2)		4,787 (39.7)		4,517 (40)		5935 (40.8)
Missing		1 (0)		11 (0.1)		15 (0.1)		8 (0.1)
Not applicable		4,352 (33.3)		3,925 (32.5)		3,524 (31.2)		4404 (30.3)
<i>Household income^a</i>								
1 st Quintile	144 (3.6)	2,119 (16.2)	136 (3.6)	1,926 (16.0)	129 (3.6)	1,824 (16.2)	137 (2.9)	2,314 (15.9)
2 nd Quintile	550 (13.9)	2,625 (20.1)	535 (14.0)	2,475 (20.5)	452 (12.7)	2,311 (20.5)	580 (12.5)	2,972 (20.4)
3 rd Quintile	901 (22.7)	2,895 (22.2)	845 (22.2)	2,645 (21.9)	786 (22.1)	2,488 (22.0)	1,056 (22.7)	3,219 (22.1)
4 th Quintile	1,109 (28)	2,797 (21.4)	1,052 (27.6)	2,607 (21.6)	1,036 (29.2)	2,406 (21.3)	1,341 (28.8)	3,154 (21.7)
5 th Quintile	1,261 (31.8)	2,629 (20.1)	1,243 (32.6)	2,394 (19.9)	1,148 (32.3)	2,251 (19.9)	1,546 (33.2)	2,896 (19.9)
Missing		5 (0)		14 (0.1)		8 (0.1)		4 (0)

a Quintiles of equalised household income among total participants in each year.

Supplementary Table S2. Distribution of unmet medical need and weekly working hours across the study period.

	2011	2012	2013	2014
	n (%)	n (%)	n (%)	n (%)
<i>Unmet medical need</i>				
<30	39 / 253 (15.4)	52 / 272 (19.1)	43 / 218 (19.7)	37 / 295 (12.5)
30–52	388 / 2662 (14.6)	343 / 2613 (13.1)	399 / 2561 (15.6)	386 / 3430 (11.3)
>52	227 / 1050 (21.6)	166 / 926 (17.9)	141 / 772 (18.3)	141 / 935 (15.1)
Total	654 / 3965 (16.5)	561 / 3811 (14.7)	583 / 3551 (16.4)	564 / 4660 (12.1)
<i>Unmet medical need due to lack of time</i>				
<30	8 / 253 (3.2)	17 / 272 (6.3)	13 / 218 (6.0)	9 / 295 (3.1)
30–52	167 / 2662 (6.3)	167 / 2613 (6.4)	206 / 2561 (8.0)	227 / 3430 (6.6)
>52	115 / 1050 (11.0)	96 / 926 (10.4)	85 / 772 (11.0)	89 / 935 (9.5)
Total	290 / 3965 (7.3)	280 / 3811 (7.3)	304 / 3551 (8.6)	325 / 4660 (7.0)
<i>Unmet medical need due to economic burden</i>				
<30	13 / 253 (5.1)	16 / 272 (5.9)	20 / 218 (9.2)	15 / 295 (5.1)
30–52	77 / 2662 (2.9)	64 / 2613 (2.5)	70 / 2561 (2.7)	42 / 3430 (1.2)
>52	38 / 1050 (3.6)	41 / 926 (4.4)	30 / 772 (3.9)	18 / 935 (1.9)
Total	128 / 3965 (3.2)	121 / 3811 (3.2)	120 / 3551 (3.4)	75 / 4660 (1.6)

Supplementary Table S3. The association of weekly working hours and unmet medical needs by gender

Weekly working hours	Male		Female	
	OR (95% CI)	<i>p</i>	OR (95% CI)	<i>p</i>
<i>Any Reason</i>				
<30	1.23 (0.89 – 1.70)	0.204	0.94 (0.75 – 1.17)	0.574
30–52	1 (Reference)		1 (Reference)	
>52	1.37 (1.19 – 1.58)	<0.001	1.46 (1.22 – 1.73)	<0.001
<i>Lack of Time</i>				
<30	0.85 (0.48 – 1.51)	0.584	0.55 (0.38 – 0.78)	<0.001
30–52	1 (Reference)		1 (Reference)	
>52	1.69 (1.39 – 2.05)	<0.001	1.73 (1.39 – 2.16)	<0.001
<i>Economic Burden</i>				
<30	2.11 (1.23 – 3.62)	0.007	1.32 (0.90 – 1.94)	0.157
30–52	1 (Reference)		1 (Reference)	
>52	1.41 (1.02 – 1.97)	0.040	1.17 (0.81 – 1.68)	0.413

Adjusted for age (continuous), household income (quintile), occupation group (blue collar or white collar), smoking status, and shiftwork (yes or no)

Bold font indicates statistical significance.

Supplementary Table S4. The association of household income and unmet medical needs.

Household income	Male		Female	
	OR (95% CI)	<i>p</i>	OR (95% CI)	<i>p</i>
<i>Any Reason</i>				
1 st quintile	2.36 (1.69 – 3.29)	<0.001	1.49 (1.08 – 2.04)	0.014
2 nd quintile	1.35 (1.09 – 1.67)	0.007	1.22 (0.98 – 1.51)	0.076
3 rd quintile	1.22 (1.001 – 1.48)	0.044	0.95 (0.78 – 1.16)	0.634
4 th quintile	1.08 (0.90 – 1.29)	0.424	1.07 (0.90 – 1.28)	0.443
5 th quintile	1 (Reference)		1 (Reference)	
<i>Lack of Time</i>				
1 st quintile	0.86 (0.49 – 1.50)	0.597	0.63 (0.35 – 1.15)	0.131
2 nd quintile	0.96 (0.71 – 1.30)	0.785	0.85 (0.63 – 1.14)	0.277
3 rd quintile	0.98 (0.76 – 1.26)	0.872	0.90 (0.70 – 1.17)	0.426
4 th quintile	1.02 (0.81 – 1.28)	0.856	1.06 (0.85 – 1.33)	0.601
5 th quintile	1 (Reference)		1 (Reference)	
<i>Economic Burden</i>				
1 st quintile	19.53 (10.17 – 37.50)	<0.001	9.30 (5.33 – 16.23)	<0.001
2 nd quintile	5.74 (3.19 – 10.33)	<0.001	4.32 (2.55 – 7.31)	<0.001
3 rd quintile	4.77 (2.72 – 8.38)	<0.001	2.80 (1.72 – 4.56)	<0.001
4 th quintile	2.51 (1.42 – 4.46)	0.002	2.17 (1.31 – 3.59)	0.003
5 th quintile	1 (Reference)		1 (Reference)	

Adjusted for age (continuous), weekly working hours (<30, 30–52, or >52), occupation group (blue collar or white collar), smoking status, and shiftwork (yes or no)

Bold font indicates statistical significance.

Supplementary Table S5. Distribution of unmet medical need and weekly working hours (<30, 30–40, 41–52, and >52) across the study period.

	2011	2012	2013	2014
	n (%)	n (%)	n (%)	n (%)
<i>Unmet medical need</i>				
<30	39 / 253 (15.4)	52 / 272 (19.1)	43 / 218 (19.7)	37 / 295 (12.5)
30–40	181 / 1349 (13.4)	165 / 1431 (11.5)	191 / 1415 (13.5)	193 / 1939 (10)
41–52	207 / 1313 (15.8)	178 / 1182 (15.1)	208 / 1146 (18.2)	193 / 1491 (12.9)
>52	227 / 1050 (21.6)	166 / 926 (17.9)	141 / 772 (18.3)	141 / 935 (15.1)
Total	654 / 3965 (16.5)	561 / 3811 (14.7)	583 / 3551 (16.4)	564 / 4660 (12.1)
<i>Unmet medical need due to lack of time</i>				
<30	8 / 253 (3.2)	17 / 272 (6.3)	13 / 218 (6.0)	9 / 295 (3.1)
30–40	71 / 1349 (5.3)	73 / 1431 (5.1)	90 / 1415 (6.4)	120 / 1939 (6.2)
41–52	96 / 1313 (7.3)	94 / 1182 (8)	116 / 1146 (10.1)	107 / 1491 (7.2)
>52	115 / 1050 (11.0)	96 / 926 (10.4)	85 / 772 (11.0)	89 / 935 (9.5)
Total	290 / 3965 (7.3)	280 / 3811 (7.3)	304 / 3551 (8.6)	325 / 4660 (7.0)
<i>Unmet medical need due to economic burden</i>				
<30	13 / 253 (5.1)	16 / 272 (5.9)	20 / 218 (9.2)	15 / 295 (5.1)
30–40	40 / 1349 (3.0)	38 / 1431 (2.7)	38 / 1415 (2.7)	17 / 1939 (0.9)
41–52	37 / 1313 (2.8)	26 / 1182 (2.2)	32 / 1146 (2.8)	25 / 1491 (1.7)
>52	38 / 1050 (3.6)	41 / 926 (4.4)	30 / 772 (3.9)	18 / 935 (1.9)
Total	128 / 3965 (3.2)	121 / 3811 (3.2)	120 / 3551 (3.4)	75 / 4660 (1.6)

Supplementary Table S6. The association of weekly working hours (<30, 30–40, 41–52, and >52) and unmet medical needs.

Weekly working hours	OR (95% CI)	<i>p</i>
<i>Any Reason</i>		
<30	1.21 (1.001 – 1.46)	0.049
30–40	1 (Reference)	
41–52	1.34 (1.19 – 1.50)	< 0.001
>52	1.59 (1.40 – 1.80)	< 0.001
<i>Lack of Time</i>		
<30	0.77 (0.56 – 1.04)	0.103
30–40	1 (Reference)	
41–52	1.45 (1.24 – 1.69)	<0.001
>52	2.00 (1.69 – 2.37)	< 0.001
<i>Economic Burden</i>		
<30	1.65 (1.19 – 2.30)	0.003
30–40	1 (Reference)	
41–52	1.06 (0.83 – 1.36)	0.642
>52	1.30 (0.99 – 1.70)	0.056

Adjusted for age (continuous), gender, household income (quintile), occupation group (blue collar or white collar), smoking status, and shiftwork (yes or no)

Bold font indicates statistical significance.

Supplementary Table S7. The odds ratios of weekly working hours (<30, 30–40, 41–52, and >52) for unmet medical needs according to household income.

Household income	Weekly working hours							
	<30		30–40		41–52		>52	
	OR (95% CI)	<i>p</i>	OR (95% CI)		OR (95% CI)	<i>p</i>	OR (95% CI)	<i>p</i>
<i>Any Reason</i>								
1 st quintile	1.42 (0.82 – 2.45)	0.210	1 (Reference)		1.52 (0.91 – 2.55)	0.112	1.56 (0.85 – 2.88)	0.152
2 nd quintile	0.88 (0.58 – 1.34)	0.552	1 (Reference)		0.99 (0.73 – 1.34)	0.955	1.31 (0.98 – 1.77)	0.073
3 rd quintile	1.44 (0.98 – 2.12)	0.066	1 (Reference)		1.50 (1.15 – 1.95)	0.002	1.70 (1.30 – 2.21)	<0.001
4 th quintile	1.21 (0.85 – 1.74)	0.290	1 (Reference)		1.24 (1.00 – 1.52)	0.049	1.54 (1.20 – 1.98)	<0.001
5 th quintile	0.81 (0.48 – 1.37)	0.441	1 (Reference)		1.63 (1.34 – 1.98)	<0.001	2.04 (1.61 – 2.59)	<0.001
<i>Lack of Time</i>								
1 st quintile	0.61 (0.12 – 3.15)	0.558	1 (Reference)		1.91 (0.66 – 5.51)	0.230	5.93 (2.18 – 16.13)	<0.001
2 nd quintile	0.59 (0.28 – 1.24)	0.165	1 (Reference)		1.22 (0.77 – 1.94)	0.386	2.24 (1.46 – 3.45)	<0.001
3 rd quintile	0.69 (0.36 – 1.33)	0.266	1 (Reference)		1.54 (1.08 – 2.19)	0.018	1.80 (1.24 – 2.61)	0.002
4 th quintile	0.93 (0.56 – 1.55)	0.773	1 (Reference)		1.32 (1.001 – 1.74)	0.048	1.85 (1.35 – 2.52)	<0.001
5 th quintile	0.64 (0.30 – 1.36)	0.249	1 (Reference)		1.72 (1.34 – 2.2)	<0.001	2.30 (1.71 – 3.11)	<0.001
<i>Economic Burden</i>								
1 st quintile	1.19 (0.63 – 2.27)	0.587	1 (Reference)		0.92 (0.48 – 1.77)	0.807	0.49 (0.20 – 1.20)	0.119
2 nd quintile	1.15 (0.61 – 2.16)	0.670	1 (Reference)		1.14 (0.69 – 1.87)	0.618	1.05 (0.61 – 1.80)	0.860
3 rd quintile	2.68 (1.32 – 5.42)	0.006	1 (Reference)		1.22 (0.72 – 2.07)	0.468	1.90 (1.15 – 3.13)	0.012
4 th quintile	1.78 (0.85 – 3.70)	0.125	1 (Reference)		1.12 (0.63 – 1.96)	0.702	2.02 (1.18 – 3.46)	0.011
5 th quintile	1.22 (0.29 – 5.13)	0.789	1 (Reference)		1.37 (0.63 – 2.97)	0.433	2.01 (0.89 – 4.52)	0.093

OR for unmet medical needs of the long working hours group (>52 hours/week) compared with the standard working hours group (30–52 hours/week)

Adjusted for age, gender, occupation group, smoking status and shiftwork

OR, odds ratio; CI, confidence interval

Bold font indicates statistical significance.