



Contents lists available at ScienceDirect

Safety and Health at Work

journal homepage: www.e-shaw.net

Original article

Workplace Violence in Workers with Multi-Party Employment Arrangements: Results from the Korean National Representative Survey



Yeongyeon Yoon, Kyunghee Jung-Choi*

Department of Occupational and Environmental Medicine, College of Medicine, Ewha Womans University, Republic of Korea

ARTICLE INFO

Article history:

Received 22 June 2021

Received in revised form

18 October 2021

Accepted 9 November 2021

Available online 14 November 2021

Keywords:

Multi-party employment arrangements

Precarious employment

Workplace violence

ABSTRACT

Background: Despite a growing number of investigations exploring the health problems in precarious workers, there is still a paucity of studies investigating workplace violence in workers with multi-party employment arrangements (WMPEAs). This study was aimed at comparing the prevalence of workplace violence between non-WMPEA and WMPEA.

Methods: The 5th Korean Working Conditions Survey data were used. The study subjects were employees aged 20–74, with 26,239 non-WMPEA and 1,556 WMPEA. WMPEA included temporary agency workers and workers providing outsourced services. Workplace violence including verbal abuse, unwanted sexual attention, threats, and humiliating behaviors were used as outcome variables. The odds ratios of risk of workplace violence were calculated using multiple logistic regression.

Results: The age-standardized prevalence of workplace violence was significantly higher among WMPEA. After adjusting for all covariates, the risk of workplace violence among WMPEA was still significant (OR 1.80, 95% CI 1.5–2.2) compared with non-WMPEA. The odds ratio of workplace violence among female WMPEA was 1.99 (95% CI 1.53–2.59), which is higher than that of male WMPEA (OR 1.52, 95% CI 1.18–1.96).

Conclusion: We found that WMPEA were exposed to higher risk of workplace violence. Discrimination against WMPEA in the working environment and management policy need to be corrected. It is also necessary to identify the risk factors of workplace violence in WMPEA and to make efforts to prevent violence.

© 2021 Occupational Safety and Health Research Institute, Published by Elsevier Korea LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Precarious employment is a complex labor market situation characterized by job vulnerability, temporary working conditions, and low social protection and income [1]. Precarious employment affects the health of not only workers but also families and communities, and is known as a social determinant of health [2,3]. Studies on precarious employment have been increasing due to the global severity of the problems [1]. Multi-party employment relationship is one of various types of precarious employment [4].

A multi-party employment relationship was defined as an arrangement involving multiple parties: a worker, the user firm for which the work is performed, and the agency that deploys and

pays a worker [5]. Workers with multi-party employment arrangements (WMPEAs) can be divided into temporary agency workers (TAWs) and workers providing outsourced services (WOS). TAWs refer to cases where temporary employment agencies and employees maintain their employment relations and employees work under the supervision of the user firm [5–7]. WOS are employed by one enterprise to provide a specified service regularly, and they work to provide a specified service to the user firm under the supervision of the employing enterprise [5]. For example, their employers include cleaning service providers and security service companies [6]. According to Statistics Korea's 2017 Economically Active Population Survey, the proportion of WMPEA was 4.4% [8]. As high-risk work is separated from usual work by

Kyunghee Jung-Choi: <https://orcid.org/0000-0002-9800-0994>

Abbreviations: WMPEA, multi-party employment arrangement; TAW, temporary agency worker; WOS, workers providing outsourced services; KWCS, Korean Working Conditions Survey; EWCS, European Working Conditions Survey.

* Corresponding author. Department of Occupational and Environmental Medicine, College of Medicine, Ewha Womans University, 25, Magokdong-ro 2-gil, Gangseo-gu, Seoul, 07804, Republic of Korea.

E-mail address: jungchoi@ewha.ac.kr (K. Jung-Choi).

2093-7911/\$ – see front matter © 2021 Occupational Safety and Health Research Institute, Published by Elsevier Korea LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.shaw.2021.11.002>

Table 1
General characteristics of study subjects N (%)

	Non-WMPEA*			WMPEA*		
	Men	Women	Total	Men	Women	Total
Total	12,653 (48.2)	13,586 (51.8)	26,239 (100)	776 (49.9)	780 (50.1)	1556 (100)
Age						
20–29	1599 (12.6)	1727 (12.7)	3326 (12.7)	33 (4.3)	20 (2.6)	53 (3.4)
30–39	3346 (26.4)	2874 (21.2)	6220 (23.7)	58 (7.5)	42 (5.4)	100 (6.4)
40–49	3333 (26.3)	3764 (27.7)	7097 (27.1)	111 (14.3)	117 (15.0)	228 (14.7)
50–59	2745 (21.7)	3551 (26.1)	6296 (24.0)	192 (24.7)	250 (32.1)	442 (28.4)
≥60	1630 (12.9)	1670 (12.3)	3300 (12.6)	382 (49.2)	351 (45.0)	733 (47.1)
Education						
Middle school or less	861 (6.8)	1405 (10.3)	2266 (8.6)	261 (33.6)	319 (40.9)	580 (37.3)
High school	4062 (32.1)	5089 (37.5)	9151 (34.9)	388 (50.0)	353 (45.3)	741 (47.6)
College or more	7730 (61.1)	7092 (52.2)	14,822 (56.5)	127 (16.4)	108 (13.9)	235 (15.1)
Income (in 10,000 KRW[†])						
<100	460 (3.6)	1487 (11.0)	1947 (7.4)	44 (5.7)	218 (28.0)	262 (16.8)
100–200	1891 (15.0)	5982 (44.0)	7873 (30.0)	351 (45.2)	447 (57.3)	798 (51.3)
200–300	3789 (30.0)	4105 (30.2)	7894 (30.1)	215 (27.7)	92 (11.8)	307 (19.7)
300–400	3633 (28.7)	1276 (9.4)	4909 (18.7)	105 (13.5)	8 (1.0)	113 (7.3)
400–500	1658 (13.1)	382 (2.8)	2040 (7.8)	45 (5.8)	5 (0.6)	50 (3.2)
≥500	1222 (9.7)	354 (2.6)	1576 (6.0)	16 (2.1)	10 (1.3)	26 (1.7)
Employment status						
Permanent	10,923 (86.3)	10,487 (77.2)	21,410 (81.6)	280 (36.1)	368 (47.2)	648 (41.7)
Temporary	1168 (9.2)	2527 (18.6)	3695 (14.1)	187 (24.1)	288 (36.9)	475 (30.5)
Daily	562 (4.4)	572 (4.2)	1134 (4.3)	309 (39.8)	124 (15.9)	433 (27.8)
Job category						
White	5260 (41.6)	6186 (45.5)	11,446 (43.6)	46 (5.9)	64 (8.2)	110 (7.1)
Pink	2110 (16.7)	4967 (36.6)	7077 (27.0)	31 (4.0)	292 (37.4)	323 (20.8)
Blue	5283 (41.8)	2433 (17.9)	7716 (29.4)	699 (90.1)	424 (54.4)	1123 (72.2)
Company size						
<10	4436 (35.1)	7146 (52.6)	11,582 (44.1)	325 (41.9)	363 (46.5)	688 (44.2)
10–49	4365 (34.5)	4166 (30.7)	8531 (32.5)	345 (44.5)	275 (35.3)	620 (39.9)
50–249	2323 (18.4)	1637 (12.1)	3960 (15.1)	80 (10.3)	106 (13.6)	186 (12.0)
≥250	1529 (12.1)	637 (4.7)	2166 (8.3)	26 (3.4)	36 (4.6)	62 (4.0)
Work period (year)						
<5	5192 (41.0)	7811 (57.5)	13,003 (49.6)	451 (58.1)	508 (65.1)	959 (61.6)
5–9	3046 (24.1)	3346 (24.6)	6392 (24.4)	139 (17.9)	177 (22.7)	316 (20.3)
10–14	1829 (14.5)	1393 (10.3)	3222 (12.3)	82 (10.6)	57 (7.3)	139 (8.9)
≥15	2586 (20.4)	1036 (7.6)	3622 (13.8)	104 (13.4)	38 (4.9)	142 (9.1)
Working hours						
<40	802 (6.3)	2451 (18.0)	3253 (12.4)	145 (18.7)	331 (42.4)	476 (30.6)
40	5963 (47.1)	5984 (44.1)	11,947 (45.5)	213 (27.5)	247 (31.7)	460 (29.6)
41–52	3698 (29.2)	3640 (26.8)	7338 (28.0)	209 (26.9)	162 (20.8)	371 (23.8)
53–68	1743 (13.8)	1307 (9.6)	3050 (11.6)	100 (12.9)	30 (3.9)	130 (8.4)
≥69	447 (3.5)	204 (1.5)	651 (2.5)	109 (14.1)	10 (1.3)	119 (7.7)
Shift work						
No	10,969 (86.7)	12,169 (89.6)	23,138 (88.2)	547 (70.5)	675 (86.5)	1222 (78.5)
Yes	1684 (13.3)	1417 (10.4)	3101 (11.8)	229 (29.5)	105 (13.5)	334 (21.5)
Customer-facing work						
No	7556 (59.7)	5628 (41.4)	13,184 (50.3)	524 (67.5)	404 (51.8)	928 (59.6)
Yes	5097 (40.3)	7958 (58.6)	13,055 (49.8)	252 (32.5)	376 (48.2)	628 (40.4)
Job demands						
Low	9604 (75.9)	10,364 (76.3)	19,968 (76.1)	542 (69.9)	576 (73.9)	1118 (71.9)
High	3049 (24.1)	3222 (23.7)	6271 (23.9)	234 (30.2)	204 (26.2)	438 (28.2)

* WMPEA: Workers with multi-party employment arrangements.

† KRW: Korean won.

user firms, the safety and health performance of such firms appears to be improved. The high-risk work was passed on to WMPEA; thus, WMPEA could be considered as extreme cases of precarious employment [9,10].

Workplace violence can be defined as “Any action, incident or behavior that departs from reasonable conduct in which a person is assaulted, threatened, harmed, injured in the course of, or as a direct result of, his or her work” [11]. Workers may experience mental problems, such as anxiety, depression, insomnia, and posttraumatic stress disorder, and physical problems, such as cardiovascular disease, due to workplace violence [12–16]. Workplace violence can also negatively affect workplace output by reducing job satisfaction and commitment and increasing turnover intentions [17–19].

Previous studies have shown that WMPEA had a high risk of accidents and injuries, and their self-rated health and mental health were poorer than those of the user firm employees [20–23].

However, few studies have compared the level of workplace violence. This study aimed to compare the risk of workplace violence between WMPEA and non-WMPEA.

2. Materials and methods

2.1. Study subjects

This study was conducted using the 5th Korean Working Conditions Survey (KWCS) in 2017. These data were benchmarked by the European Working Conditions Survey (EWCS) and the United Kingdom’s Labor Force Survey. Data were collected by the Occupational Safety and Health Research Institute in Korea to investigate the working environment of workers aged ≥15 years.

The total number of respondents in the questionnaire was 50,205. In this study, the subjects were limited to 20–74-year-old employees excluding employers. Finally, 27,795 individuals (13,429

Table 2
Age-standardized prevalence of workplace violence by non-WMPEA* and WMPEA*

	Firm		Workplace violence [†]	Verbal abuse	Humiliating behaviours
Total	Non-WMPEA* (n = 27,104)	n	1702	1196	869
		% (95% CI)	6.9 (6.5-7.3)	4.8 (4.5-5.1)	3.5 (3.2-3.7)
	WMPEA* (n = 1727)	n	191	148	104
		% (95% CI)	12.8 (10.0-15.7)	10.0 (7.5-12.6)	7.1 (5.0-9.2)
Men	Non-WMPEA* (n = 12,994)	n	821	619	446
		% (95% CI)	7.0 (6.5-7.6)	5.3 (4.8-5.8)	3.7 (3.3-4.1)
	WMPEA* (n = 855)	n	111	89	55
		% (95% CI)	13.0 (9.4-16.6)	10.0 (6.9-13.2)	6.2 (3.8-8.6)
Women	Non-WMPEA* (n = 14,110)	n	881	577	423
		% (95% CI)	6.8 (6.3-7.3)	4.4 (4.0-4.8)	3.2 (2.9-3.6)
	WMPEA* (n = 872)	n	80	59	49
		% (95% CI)	13.5 (8.4-18.5)	10.8 (6.2-15.3)	8.7 (4.7-12.7)

* WMPEA: Workers with multi-party employment arrangements.

† Workplace violence included verbal abuse, humiliating behaviors, threats, and unwanted sexual attention.

men, 14,366 women) were selected, except for military personnel and those who did not respond to the variables to be used in research. Among them, 26,239 individuals (94.4%; 12,653 men, 13,586 women) were non-WMPEA, and 1,556 individuals (5.6%; 776 men, 780 women) were WMPEA, including 639 TAW and 917 WOS.

It is a secondary data analysis that does not include the contents that can identify personal information of the research subject. This study was approved by the Institutional Review Board of Ewha Womans University Seoul Hospital (IRB approval number: SEUMC 2020-05-024).

2.2. Variables

The KWCS questionnaire divided violence into 12 months of physical violence, bullying/harassment, and sexual harassment and 1 month of verbal abuse, humiliating behaviors, threats, and unwanted sexual attention. The prevalence of physical violence, bullying/harassment, and sexual harassment for 12 months was considerably lower than that of verbal abuse, humiliating behaviors, threats, and unwanted sexual attention for 1 month, and as it was further divided into WMPEA and non-WMPEA, very few individuals reported experiencing these; therefore, this classification was excluded from the analysis. In this study, workplace violence was defined as one or more experiences of verbal abuse, unwanted sexual attention, threats, and humiliating behaviors in the past month. The workplace violence questionnaire in KWCS was "Over the last month, during the course of your work, have you been subjected to any of the following?" with answers "Yes, No, Don't know, and Refusal" for each type of violence: verbal abuse, humiliating behaviors, threats, and unwanted sexual attention. Threats and unwanted sexual attention were excluded from subgroup analysis, because few reported experiencing them at the workplace.

KWCS included the question to identify the source of study subject's wages, "Did you receive wages at the place where you worked? Or did you get it from a temporary employment agency or service providing agency?" According to the results, the responders were classified as non-WMPEA if they reported receiving wages from the workplace. When workers received wages from a temporary employment agency or a service providing agency, they were classified as WMPEA.

Covariates included employment status, occupations, company size, work period, working hours, shift work, customer-facing work, and job demands as factors of job stress. Employment status

according to the employment contract was classified into permanent employee, temporary employee, and daily worker. The definitions are as follows: Permanent employees have no restrictions on the duration of the employment contract, which can last longer than 1 year. Temporary employees are those whose employment contract period is more than 1 month and less than 1 year. Daily workers have a period of less than one month of employment contract or are working on daily wages.

Occupations were divided into three job categories: managers, professionals, technicians and associate professionals, and clerical support workers were identified as white-collar workers, services and sales workers as pink-collar workers. In addition, skilled agricultural, forestry, and fishery workers, craft and craft-related trade workers, plant and machine operators and assemblers, and elementary occupation workers were classified as blue-collar workers. The company size was divided into less than 10, 10–49, 50–249, and more than 250 employees depending on the number of workers in the current workplace.

Working period was divided into less than 5 years, 5–9 years, 10–14 years, and 15 years or more. Working hours were classified into less than 40 hours, 40 hours, 41–52 hours, 53–68 hours, and more than 69 hours based on the Korean Labor Standards Act. Customer-facing work was identified as "dealing directly with people who are not employees at your workplace such as customers, passengers, pupils, patients, etc." The exposure to customer-facing work was categorized as high if the exposure was "half of the time—all of the time" of working hours and low if it was "never— $\frac{1}{4}$ of the time." For assessing job demands, questions about "working at very high speed," "working to tight deadlines," "you have enough time to get the job done," and "you know what is expected of you at work," were asked to assess psychological workload. The response was converted into 100 points, and the job was considered highly demanding if the score was 50 or higher and not if it was less than 50.

2.3. Statistical analysis

To compare the prevalence between WMPEA and non-WMPEA considering age distribution, a direct standardization method of 5-year units was used [24]. For the standard population, data on the population of the middle of the year in five-year age groups in 2005 were used from Statistics Korea.

To determine the magnitude of the risk of workplace violence, the odds ratio was calculated using logistic regression. Model 1 adjusted gender and age as the basic model, and Model 2 adjusted

Table 3
Distribution of workplace violence according to risk factors of workplace violence by non-WMPEA* and WMPEA* N (%)

	Non-WMPEA*				WMPEA*			
	n	Workplace violence [†]	Verbal abuse	Humiliating behaviours	N	Workplace violence [†]	Verbal abuse	Humiliating behaviours
Age								
20-29	3326	304 (9.1)	210 (6.3)	141 (4.2)	53	8 (15.1)	7 (13.2)	4 (7.5)
30-39	6220	406 (6.5)	276 (4.4)	193 (3.1)	100	19 (19.0)	15 (15.0)	11 (11.0)
40-49	7097	429 (6.0)	297 (4.2)	217 (3.1)	228	28 (12.3)	21 (9.2)	16 (7.0)
50-59	6296	353 (5.6)	252 (4.0)	192 (3.0)	442	53 (12.0)	39 (8.8)	29 (6.6)
≥60	3300	210 (6.4)	161 (4.9)	126 (3.8)	733	83 (11.3)	66 (9.0)	44 (6.0)
Education								
Middle school or less	2266	151 (6.7)	119 (5.3)	80 (3.5)	580	67 (11.6)	54 (9.3)	35 (6.0)
High school	9151	688 (7.5)	492 (5.4)	371 (4.1)	741	87 (11.7)	63 (8.5)	49 (6.6)
College or more	14,822	863 (5.8)	585 (3.9)	418 (2.8)	235	37 (15.7)	31 (13.2)	20 (8.5)
Income (in 10,000 KRW)[‡]								
<100	1947	119 (6.1)	88 (4.5)	62 (3.2)	262	13 (5.0)	9 (3.4)	9 (3.4)
100-200	7873	576 (7.3)	401 (5.1)	305 (3.9)	798	105 (13.2)	80 (10.0)	60 (7.5)
200-300	7894	544 (6.9)	387 (4.9)	253 (3.2)	307	55 (17.9)	47 (15.3)	25 (8.1)
300-400	4909	269 (5.5)	188 (3.8)	141 (2.9)	113	11 (9.7)	8 (7.1)	6 (5.3)
400-500	2040	111 (5.4)	78 (3.8)	64 (3.1)	50	5 (10.0)	3 (6.0)	2 (4.0)
≥500	1576	83 (5.3)	54 (3.4)	44 (2.8)	26	2 (7.7)	1 (3.8)	2 (7.7)
Employment status								
Permanent	21,410	1311 (6.1)	912 (4.3)	683 (3.2)	648	82 (12.7)	61 (9.4)	54 (8.3)
Temporary	3695	307 (8.3)	219 (5.9)	150 (4.1)	475	53 (11.2)	43 (9.1)	26 (5.5)
Daily	1134	84 (7.4)	65 (5.7)	36 (3.2)	433	56 (12.9)	44 (10.2)	24 (5.5)
Job category								
White	11,446	538 (4.7)	373 (3.3)	241 (2.1)	110	14 (12.7)	12 (10.9)	9 (8.2)
Pink	7077	663 (9.4)	450 (6.4)	335 (4.7)	323	44 (13.6)	34 (10.5)	25 (7.7)
Blue	7716	501 (6.5)	373 (4.8)	293 (3.8)	1123	133 (11.8)	102 (9.1)	70 (6.2)
Company size								
<10	11,582	739 (6.4)	491 (4.2)	366 (3.2)	688	79 (11.5)	66 (9.6)	45 (6.5)
10-49	8531	546 (6.4)	389 (4.6)	280 (3.3)	620	83 (13.4)	59 (9.5)	44 (7.1)
50-249	3960	271 (6.8)	206 (5.2)	137 (3.5)	186	17 (9.1)	13 (7.0)	6 (3.2)
≥250	2166	146 (6.7)	110 (5.1)	86 (4.0)	62	12 (19.4)	10 (16.1)	9 (14.5)
Work period (year)								
<5	19,395	940 (7.2)	659 (5.1)	449 (3.5)	959	105 (10.9)	84 (8.8)	47 (4.9)
5-9	4780	439 (6.9)	300 (4.7)	240 (3.8)	316	50 (15.8)	38 (12.0)	33 (10.4)
10-14	2064	177 (5.5)	128 (4.0)	96 (3.0)	139	21 (15.1)	13 (9.4)	15 (10.8)
≥15	3622	146 (4.0)	109 (3.0)	84 (2.3)	142	15 (10.6)	13 (9.2)	9 (6.3)
Working hours								
<40	3253	198 (6.1)	136 (4.2)	100 (3.1)	476	40 (8.4)	31 (6.5)	20 (4.2)
40	11,947	576 (4.8)	402 (3.4)	286 (2.4)	460	62 (13.5)	45 (9.8)	43 (9.3)
41-52	7338	529 (7.2)	366 (5.0)	273 (3.7)	371	45 (12.1)	36 (9.7)	22 (5.9)
53-68	3050	306 (10.0)	216 (7.1)	162 (5.3)	130	20 (15.4)	16 (12.3)	8 (6.2)
≥69	651	93 (14.3)	76 (11.7)	48 (7.4)	119	24 (20.2)	20 (16.8)	11 (9.2)
Shift work								
No	23,138	1316 (5.7)	913 (3.9)	644 (2.8)	1222	122 (10.0)	90 (7.4)	63 (5.2)
Yes	3101	386 (12.4)	283 (9.1)	225 (7.3)	334	69 (20.7)	58 (17.4)	41 (12.3)
Customer-facing work								
No	13,184	460 (3.5)	318 (2.4)	212 (1.6)	928	89 (9.6)	63 (6.8)	45 (4.8)
Yes	13,055	1242 (9.5)	878 (6.7)	657 (5.0)	628	102 (16.2)	85 (13.5)	59 (9.4)
Job demands								
Low	19,968	1210 (6.1)	862 (4.3)	601 (3.0)	1118	129 (11.5)	107 (9.6)	68 (6.1)
High	6271	492 (7.8)	334 (5.3)	268 (4.3)	438	62 (14.2)	41 (9.4)	36 (8.2)

* WMPEA: Workers with multi-party employment arrangements.

† KRW: Korean won.

‡ Workplace violence included verbal abuse, humiliating behaviors, threats, and unwanted sexual attention.

gender, age, education, income, employment status, job category, and company size. Model 3 further adjusted work period, working hours, shift work, customer-facing work, and job demands in addition to Model 2. Analysis was performed through SAS 9.4 (Statistical Analysis System, SAS Institute, Cary, NC).

3. Results

Table 1 shows the age, education level, income, and occupational characteristics of the study subjects. 20-40s were higher in non-WMPEA, and those in their 50s and over 60s were higher in WMPEA. The proportion of graduates from “high school or lower” was higher in WMPEA, and “college, and university or more” was higher in non-WMPEA. The distribution rate of income was high at less than 2 million Korean won (KRW) for WMPEA and over 2 million KRW for non-WMPEA. Permanent employees accounted for

80% of non-WMPEA, while temporary and daily workers accounted for more than half of WMPEA. 90.1% of male WMPEA were blue-collar workers. The proportion of working 40 hours, 41–52 hours, and 53–68 hours was higher in non-WMPEA, whereas the proportion of working less than 40 hours and more than 69 hours was higher in WMPEA. Customer-facing work was more prevalent in non-WMPEA.

Table 2 shows the number of workplace violence experienced and age-standardized prevalence of workplace violence in non-WMPEA and WMPEA. The prevalence of workplace violence was higher in WMPEA than in non-WMPEA for both men and women. The prevalence of workplace violence, verbal abuse, and humiliating behaviors was 12.8%, 10.0%, and 7.1% among WMPEA, respectively, whereas 6.9%, 4.8%, and 3.5% among non-WMPEA.

Table 3 shows the distribution of workplace violence according to the risk factors. Proportion of workplace violence, verbal abuse,

and humiliating behaviors were highest in their 20s and 30s among non-WMPEA and WMPEA. Regarding the job category, workplace violence was the highest in pink-collar workers. Working more than 52 hours had a higher risk of workplace violence. In the case of shift work, customer-facing work, and high job demands, respondents reported high prevalence of workplace violence in both non-WMPEA and WMPEA. The prevalence of workplace violence according to risk factors stratified by men and women is presented in supplemental digital content 1 and 2.

Table 4 shows the odds ratios of workplace violence in WMPEA compared with non-WMPEA. In Models 1 and 2, the risk of workplace violence, verbal abuse, and humiliating behaviors among WMPEA was about twice significantly high in both genders, men and women. In Model 3, after adjusting all covariates, the risk of workplace violence among WMPEA was still significant (OR 1.80, 95% CI 1.5-2.2). The odds ratio of workplace violence among female WMPEA was 1.99 (95% CI 1.53-2.59), which is higher than that of male WMPEA (OR 1.52, 95% CI 1.18-1.96).

4. Discussion

The age-standardized prevalence of workplace violence was significantly higher among WMPEA. The risk of workplace violence was twice as high for female WMPEA compared with non-WMPEA even after adjusting all covariates. This study confirmed that being a non-WMPEA or a WMPEA was an important factor of workplace violence in both genders.

The health-related consequences of WMPEA were found to be compromised in various aspects, including injuries and accidents, illnesses, subjective health, and mental health. According to a study on fatal workplace accidents in the Finnish manufacturing industry and a study on the injury rates in the U.S. construction industry, more accidents occurred in WMPEA than in user firm employees [20,21]. In a study comparing the health status of non-WMPEA and WMPEA at Korean shipyards, the prevalence of occupational diseases and general diseases was insignificantly higher in non-WMPEA (10%) than in WMPEA (6%); however, self-perceived health status was statistically significantly worse in WMPEA [22]. In a study of work-related health problems in Korean employees, WMPEA had a two times higher risk of injuries and about three times higher risk of developing anxiety and depression compared with user firm workers. In addition, WMPEA had a 3.56-fold higher risk of absenteeism than user firm workers [23].

Previous studies have reported that the health problems of WMPEA are mainly due to job characteristics and the working environment. Transferring the hazardous work to WMPEA, lesser

access to industrial health and safety services, weakening regulations, and economic pressures worsen occupational health outcomes in WMPEA [20,21]. These poor conditions of WMPEA could not only lead to various diseases and injuries [25,26] but also increase the risk of workplace violence.

Few studies have compared workplace violence between WMPEA and non-WMPEA. According to an Australian study on the relationship between precarious employment and workplace violence, the risk of workplace violence was greater in precarious workers than in non-precarious workers [27]. For precarious workers, it is difficult to manage workplace violence due to lack of experience, skills, bargaining power, and lack of management support, which can worsen the problem. In addition, WMPEA may work mainly in industries with close contact with the public, such as taxi drivers, late-night retailers, and fast food stores [27]. The prevalence of workplace violence was higher in close relationships between customers and employees. In this study, the prevalence of workplace violence was high in both non-WMPEA and WMPEA among those doing customer-facing work. However, even after adjusting for all covariates including customer-facing work, job demands, working hours, work period, company size, job category, and employment status, the risk of workplace violence was higher in WMPEA than in non-WMPEA.

A power imbalance between user firms and subcontractors and the user firm's autocratic leadership could cause discrimination against WMPEA, which would lead to ambiguity and conflict due to a lack of meaningful and productive conversations [28]. These intrinsically subordinate characteristics of subcontractors could increase the risk of workplace violence. This would be why the risk of workplace violence was still higher in WMPEA even after adjusting all covariates.

It should also be noted that female WMPEA had a higher risk of violence than male WMPEA. For female WMPEA, the increased risk of violence compared to female non-WMPEA was higher than that for male WMPEA compared to male non-WMPEA. Accordingly, female WMPEA tended to have a higher risk of violence than male non-WMPEA, female non-WMPEA, and male WMPEA. Thus, it is possible that female WMPEA were experiencing gender discrimination in addition to the poor working conditions and status discrimination among the WMPEA mentioned above.

It is recommended to interpret this study carefully because it has the following limitations. First, although similar to the results of the Economically Active Population Survey, the proportion of WMPEA was much smaller (5.6%) than that of non-WMPEA (94.4%); thus, not all workplace violence types could be analyzed. In addition, when classified according to who was the perpetrator of

Table 4
The risk of workplace violence in WMPEA* (reference: non-WMPEA*)

		Model 1 OR [†] (95% CI) [‡]	Model 2 OR [†] (95% CI) [‡]	Model 3 OR [†] (95% CI) [‡]
Total	Workplace violence [†]	2.29 (1.94-2.71)	1.94 (1.63-2.31)	1.80 (1.50-2.16)
	Verbal abuse	2.41 (2.00-2.90)	1.96 (1.61-2.39)	1.79 (1.46-2.20)
	Humiliating behaviours	2.19 (1.76-2.73)	1.95 (1.55-2.46)	1.81 (1.42-2.29)
Men	Workplace violence [†]	2.53 (2.02-3.16)	1.81 (1.42-2.31)	1.52 (1.18-1.96)
	Verbal abuse	2.57 (2.01-3.29)	1.73 (1.32-2.26)	1.45 (1.10-1.92)
	Humiliating behaviours	1.99 (1.47-2.69)	1.63 (1.17-2.26)	1.32 (0.94-1.86)
Women	Workplace violence [†]	2.03 (1.58-2.60)	1.97 (1.52-2.55)	1.99 (1.53-2.59)
	Verbal abuse	2.19 (1.64-2.92)	2.16 (1.60-2.91)	2.18 (1.61-2.96)
	Humiliating behaviours	2.44 (1.78-3.36)	2.27 (1.64-3.16)	2.26 (1.62-3.15)

Model 1: adjusted for gender, age.

Model 2: adjusted for gender, age, education, income, employment status, job category, company size.

Model 3: adjusted for gender, age, education, income, employment status, job category, company size, work period, working hours, shift work, customer-facing work, job demands.

* WMPEA: Workers with multi-party employment arrangements.

[†] Workplace violence included verbal abuse, humiliating behaviors, threats, and unwanted sexual attention.

[‡] OR: odds ratio.

[§] CI: confidence interval.

workplace violence, the number was smaller and further analysis was not possible. It is necessary to gather a sufficient number through the oversampling method when studying nonregular workers with a small fraction. Second, as the KWCS is a one-on-one interview survey method, there may be underreporting due to reluctance to reveal the experience of workplace violence. However, it is difficult to determine if there is significant difference in underreporting between non-WMPEA and WMPEA. This is a non-differential misclassification that could rather underestimate the results of the study. Third, because this is a cross-sectional study, comparisons do not mean causality.

Despite some limitations, this study is meaningful in that it compares workplace violence between non-WMPEA and WMPEA using representative national data. It is necessary to identify the main factors causing workplace violence in WMPEA and figure out measures to overcome the problems. Policies should be in place to reduce the prevalence of workplace violence and improve workers' physical and mental health levels. In addition, efforts to reduce discrimination in the working environment or compensation are warranted, and job insecurity should be minimized.

5. Conclusions

The prevalence of workplace violence was higher in WMPEA than in non-WMPEA. The risk of workplace violence in WMPEA was still significantly higher among both genders after adjusted by demographic and occupational factors. Discrimination against WMPEA in the working environment and management policy need to be corrected. It is also necessary to identify the risk factors of workplace violence in WMPEA and to make efforts to prevent violence.

Conflicts of interest

All authors have no conflicts of interest to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.shaw.2021.11.002>.

References

- Benavides FG, Benach J, Muntaner C, Delclos GL, Catot N, Amable M. Associations between temporary employment and occupational injury: what are the mechanisms? *Occup Environ Med* 2006;63:416–21.
- Benach J, Muntaner C. Employment and working conditions as health determinants. In: The commission on Social Determinants of Health Knowledge Networks, Lee JH, Sadana R, editors. *Improving equity in health by addressing social determinants*. Geneva (Switzerland): The World Health Organization; 2011. p. 165–95.
- Benach J, Muntaner C, Solar O, Santana V, Quinlan M. *Employment, work, and health inequalities: a global perspective*. Geneva (Switzerland): The World Health Organization; 2007. 478p.
- International Labour Organization. *Non-standard employment around the world: understanding challenges, shaping prospects*. Geneva (Switzerland): The International Labour Organization; 2016. p. 7–45.
- International Labour Organization. *Multi-party work relationships: concepts, definitions and statistics*. Geneva (Switzerland): The International Labour Organization; 2018. p. 30–2.
- Statistics Korea [Internet]. *Supplementary results of the economically active population survey by employment type; 2017*. Available from: http://kostat.go.kr/portal/korea/kor_nw/1/3/2/index.board 2017.
- Suga M. Input-output analysis of dispatched employees in Japan. *J Econ Study Northeast Asia* 2012;8:59–74.
- Kim YS. Scale and status of non-standard workers: the statistics Korea's supplementary results of the economically active population survey. Seoul (Korea). Korea Labour & Society Institute; 2017. 14 p.
- Mayhew C, Quintan M, Ferris R. The effects of subcontracting/outsourcing on occupational health and safety: survey evidence from four Australian industries. *Saf Sci* 1997;25:163–78.
- Quinlan M, Bohle P. Under pressure, out of control, or home alone? Reviewing research and policy debates on the occupational health and safety effects of outsourcing and home-based work. *Int J Health Serv* 2008;38:489–523.
- Chappell D, Di Martino V. *Violence at work*. Geneva (Switzerland): The International Labour Organization; 2006.
- Xu T, Magnusson Hanson LL, Lange T, Starkopf L, Westerlund H, Madsen IEH, Rugulies R, Pentti J, Stenholm S, Vahtera J, Hansen AM, Virtanen M, Kivimäki M, Rod NH. Workplace bullying and workplace violence as risk factors for cardiovascular disease: a multi-cohort study. *Eur Heart J* 2019;40:1124–34.
- Palma A, Ansoleaga E, Ahumada M. Workplace violence among health care workers. *Rev Med Chil* 2018;146:213–22.
- Carbo J, Hughes A. Workplace bullying: developing a human rights definition from the perspective and experiences of targets. *J Labor Soc* 2010;13:387–403.
- Kim GH, Lee HS, Jung SW, Lee JG, Lee JH, Lee KJ, Kim JJ. Emotional labor, workplace violence, and depressive symptoms in female Bank employees: a questionnaire survey using the K-ELS and K-WVS. *Ann Occup Environ Med* 2018;30:17.
- Yoo T, Ye B, Kim JI, Park S. Relationship of workplace violence and perpetrators on sleep disturbance-data from the 4th Korean working conditions survey. *Ann Occup Environ Med* 2016;28:59.
- Hoel H, Cooper CL. *Destructive conflict and bullying at work*. Manchester (UK): Manchester School of Management; 2000.
- Liu W, Zhao S, Shi L, Zhang Z, Liu X, Li L, Duan X, Li G, Lou F, Jia X, Fan L, Sun T, Ni X. Workplace violence, job satisfaction, burnout, perceived organisational support and their effects on turnover intention among Chinese nurses in tertiary hospitals: a cross-sectional study. *BMJ Open* 2018;8:e019525.
- Chang HE, Cho SH. Workplace violence and job outcomes of newly licensed nurses. *Asian Nurs Res* 2016;10:271–6.
- Nenonen S. Fatal workplace accidents in outsourced operations in the manufacturing industry. *Saf Sci* 2011;49:1394–403.
- Azari-rad H, Phillips P, Thompson-Dawson W. Subcontracting and injury rates in construction. *Ind Relat Res Proc* 2003;241–8.
- Choi HR, Koh SB, Chang SJ, Cha BS, Im HJ, Lee SY, Kim JY, Kang DM, Cho SH. The health status assessment of subcontracted workers. *Korean J Occup Environ Med* 2001;13:18–30.
- Min KB, Park SG, Song JS, Yi KH, Jang TW, Min JY. Subcontractors and increased risk for work-related diseases and absenteeism. *Am J Ind Med* 2013;56(11):1296–306.
- Kebede S, Van Harmelen AL, Roman-Urrestarazu A. Wealth inequality and intimate partner violence: an individual and ecological level analysis across 20 countries. *J Interpers Violence* 2021;19. 8862605211016337.
- Kim MH, Kim CY, Park JK, Kawachi I. Is precarious employment damaging to self-rated health? Results of propensity score matching methods, using longitudinal data in South Korea. *Soc Sci Med* 2008;67(12):1982–94.
- Kim IH, Muntaner C, Khang YH, Paek D, Cho SI. The relationship between nonstandard working and mental health in a representative sample of the South Korean population. *Soc Sci Med* 2006;63(3):566–74.
- Mayhew C, Quinlan M. The relationship between precarious employment and patterns of occupational violence. In: Isaksson K, Hogstedt C, Eriksson C, Theorell T, editors. *Health effects of the new labour market*. Boston (USA): Springer; 2002. p. 183–205.
- Jalali A, Hidzir NI, Jaafar M, Dahalan N. Factors that trigger bullying amongst subcontractors toward intention to quit in the construction projects. *Built Environ Proj Asset Manag* 2020;10(1):140–52.