Impact of the minimum wage increase on intimate partner violence (IPV): a quasi-experimental study in South Korea

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ABSTRACT

Background Poverty is associated with intimate partner violence (IPV), but whether exogenous increases in wage could reduce IPV among low-income women is still unclear. We examined whether the 2018 minimum wage hike led to a reduction in IPV risk among women.

Methods Using the 2015–2019 Korean Welfare Panel Study, we employed a difference-in-differences (DID) approach to assess the effect of the minimum wage hike on IPV. The analysis focused on married women aged 19 or older. We categorised participants into a target group (likely affected by the minimum wage increase) and a comparison group based on their hourly wage. Three IPV outcomes were examined: verbal abuse, physical threat and physical assault. We conducted DID analyses with two-way fixed-effects models.

Results The increase in minimum wage was correlated with a 3.2% decrease in the likelihood of experiencing physical threat among low-income female workers (95% CI: −6.2% to −0.1%). However, the policy change did not significantly influence the risk of verbal abuse, physical assault or a combined IPV outcome. The study also highlights a higher incidence of all IPV outcomes in the target group compared with the comparison group.

Conclusions The 2018 minimum wage increase in Korea was associated with a modest reduction in physical threat among low-income female workers. While economic empowerment through minimum wage policies may contribute to IPV prevention, additional measures should be explored. Further research is needed to understand the intricate relationship between minimum wage policies and IPV, and evidence-based prevention strategies are crucial to address IPV risk.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Poverty is associated with intimate partner violence (IPV), but prior studies did not examine whether exogenous increases in income may reduce IPV.

⇒ Only few studies have examined the association between public policy and IPV victimisation.

WHAT THIS STUDY ADDS

⇒ Using a quasi-experimental approach, we evaluated whether the 2018 minimum wage hike in South Korea was associated with reductions in IPV victimisation.

⇒ The minimum wage change was associated with a modest reduction in physical threats.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Minimum wage policies may be used in conjunction with other public policy measures to reduce financial strain for women, which may in turn reduce IPV risk.

INTRODUCTION

Intimate partner violence (IPV) affects one-third of all women in their lifetime,[1] and can include any type of violence (eg, verbal abuse, threats of violence, physical assault, etc) that is perpetrated by an individual's current or former spouse or intimate partner. A systematic review of the impact of IPV on women's health has found that IPV can lead to physical and mental health problems, including depression, anxiety, self-harm, sleep disorders, chronic pain, increased risk of sexually transmitted infections, and post-traumatic stress disorder.[2]

Women in poverty may be more at risk for IPV due to a range of interconnected factors. First, women experiencing IPV are often subjected to economic abuse (ie, controlling a victim's ability to acquire, use and maintain resources that threaten her economic security and self-sufficiency), which results in dependency on the abuser, and inability to end or minimise contact with her abuser.[3] A prior literature review has identified economic dependency as a major barrier for victims when they are trying to end abusive relationships.[3] Two community-based studies have found 94%–99% of women who experience IPV have concurrently experienced economic abuse.[4] Second, lower-income women who experience IPV face additional challenges when attempting to access essential services needed to break free from the cycle of violence. These barriers may include but are not limited to transportation, temporary housing, counselling and legal assistance.[5] In a survey that included 84% of all previously identified domestic violence programmes across the USA,[6] service providers noted that lack of affordable legal representation to file for divorce or custody, avoiding evictions and obtaining protective orders often prevent victims from leaving, while the cost associated with hotel/motel stays and transportation are additional cost barriers for victims to escape abuse. A cross-sectional study based in Korea found that women with monthly income under KRW 3 million (approximately US$2300) had two times higher odds of experiencing IPV compared with those earning above 4 million Won after controlling for

confounders.[7] Given the link between poverty and the risk of IPV,[8–10] the main objective of this study is to investigate whether the reduction in poverty (through an increase in minimum wages) may reduce experiences of IPV in women. Social protection programmes that supplement income for low-wage workers may help reduce IPV.[11 12] However, evidence showing minimum increases leading to reductions in IPV is limited. One US study that examined the impact of state-level minimum wage policies on IPV found that the minimum wage did not lead to changes in the victimisation among women with high school education or less, compared with those with higher educational attainments;[13] however, it should be noted that using education as the identification strategy may be problematic since less than 50% of workers with high school education or less are earning minimum wage in the USA.[14] Another study found that minimum wage increases reduced physical and psychological violence suffered by women with a range from 0.5% to 6.6% using repeated cross-sectional data from Peru, the associations between minimum wages and sexual violence were not significant.[15] The study posits that increases in minimum wage elicit two distinct reactions. From the women's perspective, the increase in remuneration leads to heightened empowerment and consequent reduction in dependency on their partner, thereby rendering them less susceptible to experiencing violence. From the men's standpoint, this wage increase is associated with decrease in stress levels owing to augmented earnings, which subsequently results in diminished levels of violence perpetrated against their partners. However, the use of cross-sectional data and lack of an identification strategy to create target and comparison groups (ie, to identify those who are likely affected by minimum wage policy vs not) drastically reduces the study's ability to establish a causal relationship between minimum wage policy and IPV risk.

To address the limitations of prior research, we conducted a difference-in-differences (DID) study using the Korean Welfare Panel Study (KOWEPS). South Korea is an excellent case study given that in 2018, South Korea experienced a considerable increase in the minimum wage, from KRW 6470 (approximately US$5) to KRW 7530 (approximately US$6). This represented an approximate 13.3% rise in the real value of minimum wage, the largest since the inception of minimum wage laws in 1988. Among the 27 Organization for Economic Cooperation and Development (OECD) countries with minimum wage statutes, this was the most significant hike over the last two decades, elevating South Korea's minimum wage rank from 16th highest in 2016 to 14th in 2018. Based on the 2016 National Domestic Violence Survey, 12.1% of women in Korea reported experiencing IPV in the past 12 months,[16] which is relatively high considering comparable high-income countries (ie, Denmark, the UK, Ireland and the USA) have reported, on average, 4% for past 12 month IPV incidence among women.[17] In Korea, between 2011 and 2014, 31% of homicide victims were intimate partners or family members of the perpetrator, and 77% of these homicides were carried out by men.[18]

Given the aforementioned national context, our research aims to examine the impact of minimum wage increases on women's IPV risk. We address the existing research gap by using a DID approach to compare target and comparison groups to examine evidence for a causal relationship. The central research question is: Did the 2018 increase in minimum wage in South Korea effectively reduce IPV risk among women impacted by the policy, compared with those who were not?

METHOD

Data

This study employed data from the 2015 to 2019 KOWEPS. The KOWEPS is an annual household panel survey that employs a multistage stratified probability sampling technique. Based on comparisons with the 2005 Census data, the KOWEPS is a nationally representative sample of 18 856 participants from 7072 households. Our sample includes women who were 19+ years, and married or separated as of 2015, since the IPV questions were not asked among single (or partnered but unmarried) women. Individuals who had not been employed in at least 1 hour of work per week in 2016 or 2017 were excluded from the sample. This method is further substantiated by earlier research indicating that minimum wage increases have a limited influence on employment in Korea.[19] Notably, the unemployment rates before (2017) and after (2018) the implementation of the minimum wage hike remained stable at 3.8%.[20] Comprehensive information about the KOWEPS is accessible on the official website.[21] The Korean Institute for Health and Social Affairs approved the data collection and the data are publicly available. No ethical approval was necessary for this project.

Outcomes

This study examines three types of IPV: verbal abuse, physical threat, and physical assault, which were based on the following questions: in the past year (1) 'has your partner made insulting, malicious remarks about you?'; (2) 'has your partner threatened to hit or use physical violence like throwing things?'; and (3) 'has your partner physically assaulted you?'.

The responses to the questions include: '0', '1–2 times', '3–5 times', '6–10 times' and '11 or more times' within the past 12 months. We created binary variables (0 for no experience, and 1 for any incidents) for IPV outcomes. The outcome 'any IPV' was derived from a 'yes' answer to any of these three questions, indicating the person experienced one or more types of IPV in the past year.

Identification strategy

We employed the hourly wage to identify the target and comparison groups. We calculated it using the hourly income data for temporary workers and the monthly income data along with typical total working hours for permanent workers. Therefore, the target group (ie, likely minimum wage earners) comprises individuals whose hourly wages in 2016 or 2017 were equal to or less than ₩6470 (the minimum wage in 2017). Meanwhile, the comparison group (ie, earners above the minimum wage) consists of those who had hourly wages in 2016 and 2017 exceeding ₩6470. We excluded individuals receiving social assistance benefits from both the target and comparison groups due to potential confounding effects from a concurrent reform.[22] We removed the top 10% of earners from the comparison group, as these high earners may have different characteristics and potential determinants of family relations compared with workers in the target group. See figure 1 for eligibility criteria for study cohort creation. Previous studies have employed college education attainment as an identification strategy, but there is substantial misalignment between educational attainment and minimum wage earning status in Korea: while 41% of workers (in 2017) reported education below university degree, aligning with the data from Statistics Korea, only between 13% and 15% of workers in Korea are reported to be earning minimum wage.[23] Therefore, we chose to use

Figure 1 Flowchart for the selection of participants into the final cohort (2015–2019).

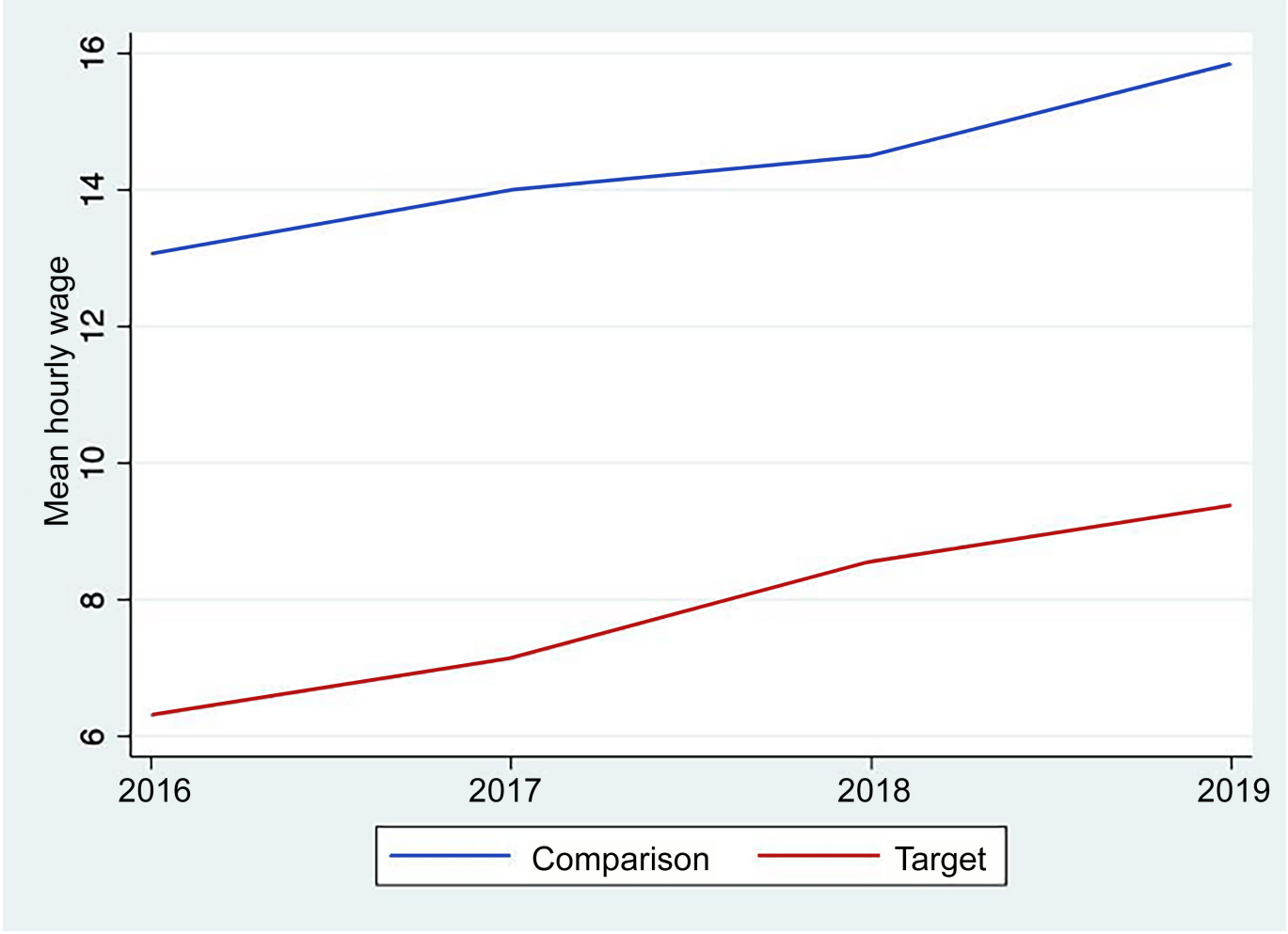

Figure 2 Average hourly wage comparison between target and comparison group from 2016 to 2019.

hourly wage instead of education for identification. From the data visualised in figure 2, it is evident that there was a substantial surge in the average hourly wage coinciding with the 2018 policy shift.

Statistical analysis

We employed a DID comparing changes between comparison and target groups in IPV victimisation over time from 2015 to 2019. As the outcome question asked self-reported IPV in the prior year, we set the year 2019 as the post-treatment period. The main advantage of individual-level Two-way Fixed Effect (TWFE) model is its ability to control for unobservable confounders that do not vary over the study period, since many unobserved individual differences can shape health and well-being outcomes. For the DID approach with binary outcomes, a linear fixed-effect method is often applied,[24] since (1) the use of logit or probit link function violates the common trends assumption in DID;[25] (2) the latest research suggest that ''linear regression is generally the best strategy to estimate causal effects of treatments on binary outcomes. Linear regression coefficients are directly interpretable in terms of probabilities and, when interaction terms or fixed effects are included, linear regression is safer.';[26] (3) fixed effects logistic regression excludes participants whose outcomes are unchanged,[27] and in the DID context, this can lead to exclusion of individuals without changes in the outcome more strongly in the control group (vs the treatment group), where the intervention is not applied. In the unadjusted models, only the postintervention and its interaction with target group status were included, while adjusted TWFE models include the following time-varying confounders: household size, self-reported health, region, home ownership and disability status. Our model equation is shown in the online supplemental figure S1.

The DID approach assumes that the comparison group reflects the counterfactual trend of the target group without intervention. This was validated by ensuring preintervention trends were parallel between the target and comparison group. We evaluated this by performing TWFE models with the interaction term between target group status and year dummies in the preintervention period, and confirmed that the interaction was insignificant, which indicates that the parallel trends assumption was not violated (see online supplemental table S1 and online supplemental figures S2–S5) for the statistical tests and plots, respectively). Sampling weights provided in KOWEPS were used to produce nationally representative estimates. We conducted sensitivity analyses to validate the main findings. First, we used data spanning extensive pre-policy and post-policy periods (from 2012 to 2020) and reran the model to demonstrate that our choice of study years was not arbitrary and that the outcomes yielded are robust and reliable. Second, we excluded those from the treatment group who worked less than 15 hours per week in the model to confirm whether the results remain consistent when focusing solely on individuals who work more hours and are consequently more likely to be heavily impacted by the minimum wage policy. Third, we excluded those aged 65 or over to determine whether the effects were consistently observed among the working-age population. Last, we applied the Callaway and Sant'Anna DID model as an alternative analytical approach to complement our main TWFE model findings.

We conducted additional analyses regarding follow-up time between target and comparison groups. The mean follow-up time for the target and comparison groups were 4.09 years and 4.32 years, respectively, and the non-parametric t-test showed no significant differences. This provides evidence that the attrition observed in our study sample is unlikely to introduce a significant bias in comparing IPV risk between the groups.

Table 1 Sample characteristics at baseline

	Baseline sample characteristics	
	Target group (%)	Comparison group (%)
All	264	1121
Age		
19–39	34 (12.88)	343 (30.60)
40–64	152 (57.58)	712 (63.51)
65+	78 (29.55)	66 (5.89)
Home ownership		
Yes	174 (65.91)	691 (61.64)
No	90 (34.09)	430 (38.36)
Education		
Postsecondary	107 (40.53)	548 (48.88)
No postsecondary	157 (59.47)	573 (51.12)
Disability		
Yes	9 (3.41)	29 (2.59)
No	255 (96.59)	1092 (97.41)
Residence		
Seoul	33 (12.50)	172 (15.34)
Metropolitan cities	86 (32.58)	302 (26.94)
Others	145 (54.92)	647 (57.72)
Self-reported health		
Good/excellent	158 (59.85)	893 (79.66)
Fair/poor	106 (40.15)	228 (20.34)
Household size		
1	5 (1.89)	18 (1.61)
2	106 (40.15)	253 (22.57)
3	60 (22.73)	269 (24.00)
4+	93 (35.23)	581 (51.83)

RESULTS

The baseline characteristics of the study participants and the incidence rates for IPV victimisation in target and comparison groups are detailed in table 1 and online supplemental file S2 . The target group (those who are likely affected by the minimum wage policy) has a higher proportion of older populations, renters, those with lower educational attainments, people with disabilities, those in poorer health and people in smaller households, compared with the comparison group. The target group also had higher incidence rates than the comparison group across all IPV outcomes (eg, 146.82 vs 132.50 for any IPV events per 1000 person-years over the study period).

Table 2 shows the main results from the DID regression models. The unadjusted models examining the effect of policy implementation across treatment status showed that the 2018 minimum wage hike was associated with a −3.2% (95% CI: −6.2% to −0.2%) reduction in the probability of receiving physical threats for women likely affected by the minimum wage. However, the policy impact on the probability of receiving other types of IPVs, verbal abuse and physical assault, does not seem significantly changed. Adjusting for covariates, such as age, health condition and residence regions, adjusted models did not change the direction or strength of the policy impact. The minimum wage hikes in 2018 reduced physical threat by −3.2% (95% CI: −6.2% to −0.1%) for low-income female workers but still had limited impact on verbal abuse and physical assault.

Table 2 Main results from the DID regression models (2015–2019)

	Coefficient	95% CIs	P value
Unadjusted TWFE models			
Verbal abuse	−0.031	−0.106 to 0.044	0.415
Physical threat	−0.032	−0.062 to −0.002	0.037
Physical assault	0.001	−0.014 to 0.016	0.853
Any	−0.032	−0.107 to 0.043	0.400
Adjusted TWFE models			
Verbal abuse	−0.031	−0.106 to 0.044	0.415
Physical threat	−0.032	−0.062 to −0.001	0.040
Physical assault	−0.016	−0.040 to 0.007	0.178
Any	−0.032	−0.107 to 0.043	0.404

DID, difference-in-differences; TWFE, Two-way Fixed Effect.

The results of sensitivity analyses (online supplemental tables S3–S6) were overall consistent with the main findings.

DISCUSSION

We found that the 2018 minimum wage increase in Korea was associated with a small reduction in physical threat.[28] Based on our results, we estimate that around 1860 fewer incidents of physical threats can be attributable to the 2018 minimum wage policy among married or separated female workers earning minimum wage. While the association between minimum wage and physical assault was consistently shown in our sensitivity tests, there is always a possibility that the association exists by chance. Furthermore, we did not find that the minimum wage hike led to changes in the risk of verbal abuse or physical assault. The specific reduction in physical threats, as opposed to verbal abuse and physical assault, might be related to the nature of these different forms of IPV. The minimum wage hike appears to mitigate stress-induced physical threats, suggesting that financial stability can be a critical factor in reducing certain immediate, stress-related IPV types. However, the persistent rates of verbal abuse and physical assault highlight the complexity of IPV. These forms, often rooted in deeper behavioural and systemic issues, may require more than short-term economic solutions. This disparity emphasises the need for multifaceted approaches to address IPV, combining economic policy with long-term strategies targeting ingrained behavioural patterns and systemic reforms.

This study suggests that the economic empowerment of women could contribute to a comprehensive strategy to reduce IPV.[29] Our study offers preliminary evidence suggesting that minimum wage policies might decrease IPV victimisation among women most impacted by such policies. However, further investigations are required to determine if other public measures can enhance women's financial autonomy and subsequently aid them in breaking away from abusive relationships. Our findings need to be put in contrast with prior studies on the impact of exogenous income increase on IPV victimisations. While our study did not find evidence that the minimum wage reduced verbal abuse and physical assault, a working paper using DID and triple-difference designs found that the minimum wage led to reductions in physical and psychological violence with a range between 0% and 6.6% among Peruvian women. This suggests a more significant impact of minimum wage policies on reducing IPV victimisation in the Peruvian context. One reason why minimum wage did not reduce physical violence in our study may be due to contextual differences, for instance, baseline rates of physical violence is significantly higher in Peru, at 8.8% in 2019 for past 12 months of experience of physical IPV,[28] while the comparable statistics in our study was 0.98% at baseline. There are also methodological differences that may contribute to divergent findings: since repeated cross-sectional data are used in the Peruvian study, the same women are not interviewed in the preintervention and postintervention periods, implying that the observed change may be the results of compositional shifts in the sample. Meanwhile, another study[13] investigated the impacts of states' minimum wage on IPV measured through self-reports of coercive control and emotional abuse among US women and found no change in the past 12 months of IPV; however, the divergent findings may be due to the IPV outcomes measured. While our study focused on overt forms of IPV, this study concentrated on the subtle and psychological dimensions of IPV, which may have different associations with minimum wage changes.'

There are limitations to our study. First, our relatively small sample size reduced our ability to discern differences in the impact of the policy across age, region and other subgroup differences. Second, there is a risk of under-reporting of IPV incidents by respondents, driven by cultural factors, social desirability bias or recall errors.[29] However, the systemic under-reporting of IPV is unlikely to be associated with the policy of our interest. Third, our study examined only the employed population and does not take into consideration potential minimum wage policy effects on employment levels or other labour market outcomes.[30] Nonetheless, prior research suggests that in the Korean context, enhancements in the minimum wage exerted a minimal effect on employment rates,[19] and the unemployment rate remained stable at 3.8% before and after the policy change.[20] Fourth, our dataset does not incorporate partner income, which may hinder our ability to explore the impact of the minimum wage on IPV through alterations in the income gap between men and women. It would be valuable for future research to examine cross-country variations in the effect of minimum wage increases on IPV, and further investigate how changes in the income disparity between men and women (via changes in minimum wage policies) may influence the risk of IPV globally. Fifth, some women may not have substantially benefited from the minimum wage hike due to a low number of working hours. In sensitivity testing, we excluded women who work less than 15 hours per week from the target group and found consistent results comparable to our main models.

Evidence-based prevention strategies are needed to tackle the intricate public health issue of IPV.[31] Studies have demonstrated that IPV victimisation predominantly affects individuals with lower socioeconomic status[32] and those benefiting from welfare programmes.[33] However, the impact of minimum wage on IPV prevention is still not conclusively established. In our quasi-experimental research, using individual-level panel data, we identified limited evidence on the relationship between the minimum wage change and IPV. Therefore, future studies should examine how minimum wage, in conjunction with other public policy measures, such as childcare and reducing the gender pay gap, may reduce financial strain for women, which might in turn reduce IPV risk.

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review. AC as the gurantor had full access to all of the data in the study and takes responsibility for the integrity of the data and the accracy of the data analysis.

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