



Workplace gender harassment, illegitimate tasks, and poor mental health: Hypothesized associations in a Swedish cohort

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ABSTRACT

Workers exposed to gender harassment and illegitimate tasks may experience adverse mental health outcomes such as depression and burnout. However, the longitudinal effects and the complex interrelationships between these variables remain largely unexplored. We investigated the cross-lagged relationships between gender harassment, illegitimate tasks, and mental health outcomes among working adults in Sweden over a period of two years, as well as the gender differences in the cross-lagged effects. Additionally, the study examined whether illegitimate tasks mediated the relationship between gender harassment and negative mental health outcomes over time. Data were drawn from the Swedish Longitudinal Occupational Survey of Health (SLOSH), covering 2796 working men and 4110 working women in a two-wave analysis from 2018 to 2020. We employed a structural equation model to examine the cross-lagged effects and the mediating effect between gender harassment, illegitimate tasks, and mental health outcomes over time. Furthermore, we applied a multigroup analysis to determine gender differences in the cross-lagged effects.

The results showed statistically significant cross-lagged relationships (forward, reverse, and reciprocal) between gender harassment, illegitimate tasks, and mental ill-health. There were statistically significant gender differences in these cross-lagged relationships (burnout: $\Delta\chi^2(47) = 106.21$, $p < 0.01$; depression: $\Delta\chi^2(47) = 80.5$, $p < 0.01$). Initial illegitimate tasks mediated the relationship between gender harassment and mental ill-health outcomes over time. The gender differences in the interrelationships between gender harassment, illegitimate tasks, and mental ill-health outcomes among workers in Sweden indicate that policies, regulations, and interventions that address these exposures in organisations must be tailored to benefit both men and women.

1. Introduction

Poor mental health such as depression, burnout, anxiety, and stress are pressing public health concerns which have garnered substantial attention both globally (Publishing, 2018) and in Sweden (Försäkring, 2015). A European Union report indicated that more than one in six people in Europe were affected by poor mental health in 2016, amounting to about 84 million people (Publishing, 2018). Of the over 30 countries that were studied in the report, Sweden recorded the sixth highest proportion (18.3%) of mental health problems in Europe. Similarly, a World Health Organisation (WHO) report showed that about 322 million people in the world lived with depression in 2015, and that women were overrepresented (Organization, 2017). This figure was an

increase of 18.4% in comparison to 2005, suggesting that mental health problems have increased at the global level. Also a Swedish report suggested that poor mental health increased, particularly among the working population, with women reporting higher levels than men (Försäkring, 2015).

This increase in mental ill-health has led to the introduction of broader and more effective interventions and policies to reduce mental health problems, particularly in Sweden. For instance, in 2015 the Swedish Ministry of Health and Social Affairs implemented a comprehensive mental health policy to increase the capacity of the Swedish welfare system to handle the numerous mental ill-health issues facing the general population (Fjellfeldt, 2021). Generally, the development of these policies has been based on the risk factors that trigger the causes of

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mental ill-health (Organization, 2014). It is well established that a poor work environment is a major risk factor for mental ill-health and also plays a role in the inequality that exists in mental ill-health (Niedhammer et al., 2021; Aronsson et al., 2017). However, while most studies of the work environment have focused on job demands, control, support, job strain, and effort–reward imbalance as risk factors for mental ill-health (Organization, 2014; Niedhammer et al., 2021; Aronsson et al., 2017), only a few studies have considered gender harassment and illegitimate tasks as explanatory factors.

1.1. Gender harassment and mental health

Gender harassment is a common form of sexual harassment within organisations. Unlike other forms of sexual harassment that focus on sexual desires, sexual interest, and unwanted sexual attention, gender harassment does not need to include any behaviour with sexual content (Leskinen and Cortina, 2014). Fitzgerald et al. developed a theoretical model to explain gender harassment, known as the Fitzgerald tripartite model of sexual harassment (Fitzgerald et al., 1995; Gelfand et al., 1995). According to Fitzgerald et al. gender harassment comprises “a broad range of verbal and nonverbal behaviors not aimed at sexual cooperation but that convey insulting, hostile, and degrading attitudes about women” (Fitzgerald et al., 1995).

Examples of gender harassment include making anti-women jokes or comments, leaving condoms in office lockers, and displaying offensive pornographic materials. Although some of the examples of gender harassment may be sexualised, the main intention is to “put down” the target by denigrating, demeaning, and rejecting he or she without any suggestion of sexual activity (Leskinen et al., 2011; Cortina and Areguin, 2021). Gender harassment has not received the same level of attention as other types of sexual harassment, for several reasons: it does not include sexually predatory components such as sexual coercion and unwanted sexual attention, it is considered to be a milder and less serious form of harassment, and it is a covert act (Leskinen et al., 2011). As well as receiving less research attention, gender harassment has almost certainly gone unreported or ignored in many organisations due to the targets believing that it is inconsequential and less important.

Nonetheless, past research on gender harassment has demonstrated a significant relationship with mental health consequences such as depression, low self-esteem, anxiety, negative body image, job stress, low psychological well-being, and use of psychotropic medication (Leskinen et al., 2011; Muhonen, 2016; Berdahl et al., 1996; Blindow et al., 2022). For example, previous studies on working population in Sweden by Blindow and colleagues found higher risk ($HR = 1.23, p < 0.05$) of psychotropic medication use among workers who experienced gender harassment (Blindow et al., 2022). However, knowledge of the directionality of the relationship is limited, as most research has been based on cross-sectional study designs. Determining the directionality of the relationship between gender harassment and poor mental health is important from both a theoretical and a practical point of view. For instance, studies by Berdahl et al. (1996) and Leskinen et al. (2011) have assumed a unidirectional relationship, where gender harassment negatively affects mental health, and not vice versa. However, there could be a reverse relationship, in which employees with poor mental health outcomes are more likely to be exposed to and affected by gender harassment over time. There could also be a reciprocal relationship, where both forward and reverse association between gender harassment and poor mental health occur simultaneously. We therefore formulated the following hypotheses:

H1a. Gender harassment at T1 will positively predict adverse mental health outcomes at T2.

H1b. Adverse mental health outcomes at T1 will positively predict gender harassment at T2.

1.2. Illegitimate tasks and mental health

The concept of illegitimate tasks was developed from the role and justice theories within the Stress-as-Offense-to-Self (SOS) framework (Semmer et al., 2007, 2010, 2015). Illegitimate tasks constitute a task-level stressor, and are defined as tasks “that violate norms about what an employee can properly be expected to do, because they are perceived as unnecessary or unreasonable; they imply a threat to one’s professional identity” (Semmer et al., 2015). This means that any task given to an employee who feels that this task should not be carried out may be considered illegitimate. For example, tasking a doctor to feed a patient may be considered illegitimate, because it violates the doctor’s professional role. According to Semmer et al. (Semmer et al., 2015), the social message that a task carries in relation to the role constellation determines whether that task may be considered as illegitimate or not. A task may seem perfectly normal, but because it carries a demeaning social message in relation to a person’s professional role, it may be considered illegitimate.

Many studies have established a strong relationship between illegitimate tasks and symptoms of mental ill-health, such as burnout, feelings of resentment, low self-esteem, depressive mood, anger, and low satisfaction (Semmer et al., 2015; Omansky et al., 2016; Eatough et al., 2016; Kilponen et al., 2021). Illegitimate tasks may serve as an identity-relevant stressor (Thoits, 1991) which poses a threat to an employee’s self-worth and self-esteem (Semmer et al., 2015). Nevertheless, most of these studies have been cross-sectional, ignoring possible reverse or reciprocal relationships between the variables. In order to clarify the directionality of the relationship between illegitimate tasks and mental ill-health, longitudinal study designs are necessary. We therefore formulated the following research hypotheses:

H2a. Illegitimate tasks at T1 will positively predict adverse mental health outcomes at T2.

H2b. Adverse mental health outcomes at T1 will positively predict illegitimate tasks at T2.

1.3. The mediating role of illegitimate tasks

Results from cross-sectional studies and a few longitudinal studies suggest a relationship between gender harassment and adverse mental health outcomes in working populations, but studies investigating the process or possible pathways in this relationship remain scarce. Johnson and Otto (García Johnson and Otto, 2020) argued that illegitimate tasks are a disguised form of gender harassment, and that female workers in organisations with higher levels of sexist climate are more likely to experience illegitimate tasks. They noted that assignment of illegitimate tasks in a sexist climate may be highly gendered, to reinforce the gender norms and roles in the organisation. For instance, female workers in a sexist climate may be instructed to undertake illegitimate tasks that are considered to be feminine, while male workers undertake illegitimate tasks that are considered to be masculine. Another study proposed that workers in organisations with higher gender harassment are assigned illegitimate tasks in order to prevent them from progressing in their professional career (García Johnson and Otto, 2019).

In line with the above, the results of a cross-sectional study indicated that gender harassment in terms of sexist climate was directly associated with illegitimate tasks (García Johnson and Otto, 2020). However, the design did not allow determination of the direction of this association. A sexist climate may lead to more illegitimate tasks in an organisation, but employees who experience illegitimate tasks may also be more likely to report gender harassment; or there may be a reciprocal relationship between these variables. Moreover, as mentioned earlier, illegitimate tasks may also predict negative mental health outcomes. Taken together, it is possible that gender harassment may have a direct effect on illegitimate tasks, and illegitimate tasks may in turn predict adverse mental health outcomes over time. This suggests that illegitimate tasks may

serve as the pathway through which gender harassment is related to adverse mental health outcomes (García Johnson and Otto, 2020). We therefore formulated the following hypotheses:

- H3a.** Gender harassment at T1 will positively predict illegitimate tasks at T2.
- H3b.** Illegitimate tasks at T1 will positively predict gender harassment at T2.
- H4a.** Illegitimate tasks at T2 will mediate the relationship between gender harassment at T1 and adverse mental health outcomes at T2.
- H4b.** Illegitimate tasks at T1 will mediate the relationship between gender harassment at T1 and adverse mental health outcomes at T2

1.4. The moderating role of gender

Differences in norms and social roles between men and women in society mean that gender plays a role in the relationship between gender harassment, illegitimate tasks, and mental ill-health (Muhonen, 2016; Omansky et al., 2016). Gender role theory posits that while women are expected to be less dominant and more communal, giving, cooperative, sensitive, and nurturing, men are expected to be more assertive, dominant, aggressive, and ambitious (Eagly et al., 2000; Hesselbart, 1981). These stereotypical ideals may influence the way men and women respond to and engage in gender harassment and illegitimate tasks at the workplace (Cortina and Areguin, 2021; Omansky et al., 2016). For example, because women are expected to be less dominant and giving, they may be expected to be more tolerant of tasks that are illegitimate, as compared to men whose dominant role makes them more reactive to such tasks (Björk et al., 2013). Similarly, women experience more harassment at work than men because men use harassment as a mechanism of social control in order to reinforce their dominance and maintain a sexist and patriarchal society (Meyer, 2008).

Gender role theory posits that there are differences in social roles for men and women, and that because women are expected to play “expressive” roles such as exhibiting emotional and caring qualities, they are often expected to engage in service jobs including teaching, nursing, education, and sales (Hesselbart, 1981). Meanwhile, men are expected to be agentic, and so are attributed with instrumental task and leadership competence; they are therefore expected to take on leadership positions, and to work in the manufacturing and industrial sector (Eagly and Karau, 2002). This contributes to segregation in the labour market, with men and women concentrated in different occupational positions (vertical segregation) and different industries (horizontal segregation). Empirical evidence has shown that employees in male-dominated organisation with male-dominated leadership positions tend to report higher levels of gender harassment (Shultz, 2018) when they do not conform to gender roles. Similarly, a study suggested that female managers were assigned more illegitimate tasks than male managers due to their attempts to break the traditional gender roles which attribute leadership positions to men (Björk et al., 2013).

1.5. The present study

Despite the plethora of evidence that gender harassment and illegitimate tasks are closely linked to mental ill-health (Leskinen et al., 2011; Muhonen, 2016; Semmer et al., 2015; Kilponen et al., 2021; Jewell and Brown, 2014), the interrelationship effects of these constructs remain largely unexplored. To our knowledge, no study has simultaneously analysed the longitudinal effects and the complex interrelationship between gender harassment, illegitimate tasks, and mental ill-health outcomes in a working population. Furthermore, although the labour market is segregated by gender, which is a risk factor for health, previous studies in this field of research have ignored this factor (Leskinen et al., 2011; Semmer et al., 2015). This is, in addition, the first longitudinal study to address the link between gender

harassment and mental ill-health via illegitimate tasks.

One aim of our study was therefore to contribute to a deeper understanding of gender differences and cross-lagged relationships between gender harassment, illegitimate tasks, and adverse mental health outcomes among the working population in Sweden over a period of two years. Another aim was to examine the mediating effects of illegitimate tasks in the relationship between gender harassment and mental ill-health. Our conceptual framework is presented in Figs. 1 and 2.

2. Methods

2.1. Study participants and procedure

This study was based on the Swedish Longitudinal Occupational Survey of Health (SLOSH), which is derived from a nationally representative sample of Swedish employees. SLOSH started in 2006 and was based on participants from the cross-sectional 2003 Swedish Work Environment Survey (SWES) (Magnusson Hanson et al., 2018). SLOSH

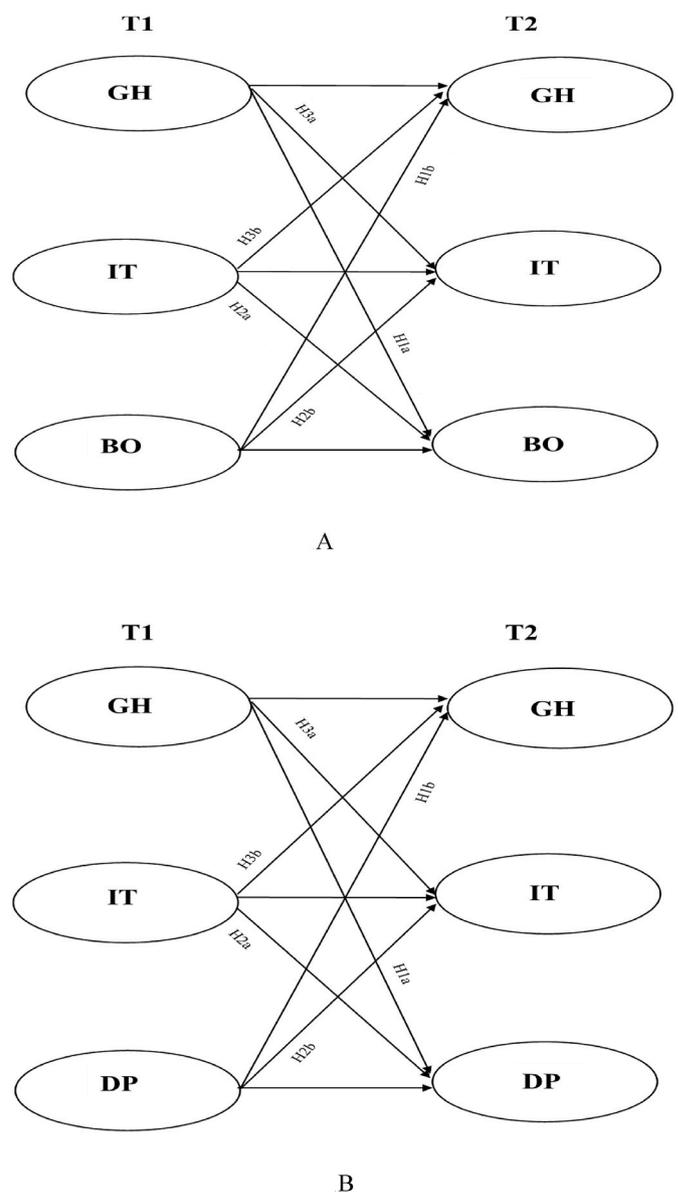


Fig. 1. A. Conceptual framework of the cross-lagged effects between gender harassment (GH), illegitimate tasks (IT), and burnout (BO). B. Conceptual framework of the cross-lagged effects between gender harassment (GH), illegitimate tasks (IT), and depression (DP).

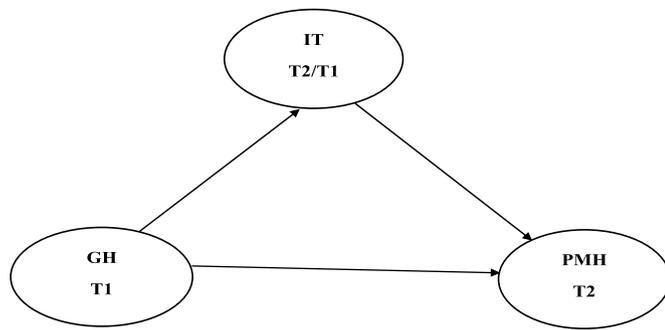


Fig. 2. Conceptual framework of the mediating effects of illegitimate tasks (IT) in the relationship between gender harassment (GH) and poor mental health (PMH). T1 and T2 represent time points separated by 2 years.

uses postal self-completion questionnaires every two years, linked with administrative registers, to follow participants over time. The first wave of SLOSH, conducted in 2006, had a 65% response rate (Linda et al., 2009). SLOSH 2018 and 2020 also invited eligible participants from SWES to participate in the cohort study. Both surveys were conducted between April and August. Out of the 37,043 (both working and non-working) eligible participants that were invited to participate in the survey in 2018, only 17,841 (48%) responded. In 2020, 35,700 respondents received the questionnaire, and 17,489 (49%) responded. Collection of data on gender harassment and illegitimate tasks began in 2018, and so the present study relied on data from 2018 to 2020. We limited our study to respondents aged 16–64 who participated in both waves and were employed at $\geq 30\%$ of full-time. Of the 6906 participants, 2796 (40.5%) were men and 4110 (59.5%) were women. The study was approved by the national ethics committee (ref: 2019–05590).

2.2. Measures

2.2.1. Gender harassment

Gender harassment was measured with four questions: “Have you been harassed by your bosses because of your gender?”, “Have you been harassed by your co-workers because of your gender?”, “Have you been subjected to harassment because of your gender by others?”, and “Have you heard or seen anyone at your workplace being harassed because of their gender?”. Each response was rated from 1 (several times a week) to 4 (no) on a Likert scale. We recoded the responses in ascending order so that higher levels of harassment were assigned higher scores.

2.2.2. Illegitimate tasks

Illegitimate tasks were measured with the Bern Illegitimate Tasks Scale (BITS) (Semmer et al., 2010), which consists of eight items. For example, “Do you have to perform tasks that make you wonder whether they have to be done at all?” Response options range from 1 (very often) to 5 (never). The responses ranked in descending order were re-coded in ascending order. The scale showed a good internal consistency of reliability ($\alpha_{T1/T2} = 0.85/0.85$). BITS is widely accepted, and has been validated in clinical studies, among the general population, and among the working population (Semmer et al., 2010; Semmer et al., 2015).

2.2.3. Mental health outcomes

Burnout and depression were used to indicate adverse mental health outcomes. Burnout was measured with the short version of the Shirom-Melamed Burnout Questionnaire (SMBQ). It includes eight items, each rated from 1 (hardly ever) to 7 (nearly all the time) on a Likert scale. The scale showed good internal consistency of reliability ($\alpha_{T1/T2} = 0.92/0.92$). The mean of each item was estimated, a sum score was created, and a cut-off of ≥ 4.4 was used as the criterion for burnout. This cut-off has been validated among working population in Sweden based on the same data (Aronsson et al., 2019).

Depression was measured with the six-item Symptom Checklist–Core Depression (SCL-CD6) scale (Magnusson Hanson et al., 2014). Respondents were asked how much they had been troubled by each of the six symptoms of depression in the past week, with response options from 1 (not at all) to 5 (a lot) on a Likert scale. The internal consistency of reliability of the scale was very good ($\alpha_{T1/T2} = 0.91/0.90$). We adopted the validated and widely accepted cut-off of ≥ 17 as the criterion for depression. The sensitivity, specificity, and validity of this cut-off criterion has been provided elsewhere (Magnusson Hanson et al., 2014).

2.2.4. Covariates

We considered demographic variables, socio-economic positions, and job characteristics as potential confounders. Demographic variables were age, gender (male vs. female), civil status (married/cohabiting vs. single), and country of birth (Sweden vs. outside Sweden). Socio-economic position comprised education (≤ 9 years of school, secondary school, < 3 years of university, ≥ 3 years of university, and research education) and occupation (International Standard Classification of Occupations, 2008).

Job characteristics included job demands, decision authority, social support, working hours, leadership role, and type of industry. Job demands, decision authority, and social support were measured with the Swedish Demand-Control-Support Questionnaire (DCSQ) (Chungkham et al., 2013). Type of industry was based on the Swedish Standard Industrial Classification (SNI), and categorised into seven major industrial groups (education, health and social care, labour-intensive service, public administration, goods and energy production, and machinery operation) in order to differentiate between female-dominated, male-dominated, and gender-mixed industries as recommended in a previous study (Cerdas et al., 2019). The covariates were selected based on their influence on both the exposure and mediator or outcome variable in previous studies (Semmer et al., 2015; Kilponen et al., 2021; Blindow et al., 2021; Tuckey et al., 2012; McLaughlin et al., 2012).

2.3. Statistical analyses

Descriptive analyses were performed by estimating the Cronbach alpha, mean, standard deviation, and Spearman rank biserial correlation coefficients at times T1 and T2. To examine the reciprocal relationships and the mediating effect between gender harassment, illegitimate tasks, and mental health outcomes over time, we used structural equation modelling (SEM) and fitted a cross-lagged panel model (CLPM) to our data. SEM is an essential tool that is able to simultaneously estimate the direct and indirect relationship between multiple constructs, while partialing out measurement errors (VanderWeele, 2012). We included all the autoregressive paths in our CLPM in order to minimise potential bias and provide a rigorous assessment of the longitudinal direct and indirect effects in the models. We fitted separate CLPMs for the two mental health outcomes (burnout and depression). Five competing SEMs were employed to examine the cross lagged and mediating effects.

Model 1 was the baseline or stability model, used in order to reduce bias in the cross-lagged effects. The stability model was used to estimate the autoregressive effects of gender harassment at time T1 and T2, illegitimate tasks at time T1 and T2, and mental health outcomes at time T1 and T2. Its goodness of fit was then compared to that of the other four models. **Model 2** was the forward association model (forward paths); this extended Model 1 by including the relationships between gender harassment at T1 and illegitimate tasks at time T2, illegitimate tasks at time T1 and mental health at time T2, and gender harassment at time T1 and mental health at time T2. **Model 3** was the reverse association model; this was similar to Model 1 but also included the relationships between mental health at time T1 and illegitimate tasks at time T2, illegitimate tasks at time T1 and gender harassment at time T2, and mental health at time T1 and gender harassment at time T2. **Model 4** was the reciprocal model, combining Models 1, 2, and 3. We also conducted a multigroup analysis to estimate the gender differences in the

model. The first step was to estimate an unconstrained model where the cross-lagged paths in the model were allowed to vary freely across gender, and the second was to estimate a constrained model where the cross-lagged paths were constrained to be equal between men and women. The full information maximum likelihood (FIML) technique was used to account for missing data (<4% missing). FIML is a popular technique that allows the SEM to account for the missing responses in the data and produce unbiased parameter estimates and standard errors (Schafer and Graham, 2002).

Model 5a and 5b were the mediating effect models. While in Model 5a we extended Model 2 by adding a path from illegitimate tasks at time T2 to mental health at time T2, in Model 5b we extended model 2 by adding a path from gender harassment at T1 to illegitimate tasks at time T1. We used a 5000-iteration bootstrapping procedure to estimate the bias-corrected 95% confidence interval (CI) to determine the statistical significance of the indirect effect (Hayes, 2013; Mensah, 2021). Since we could not use FIML to handle missing data when estimating the bootstrapping confidence interval and standard error of the indirect effect, we used an imputation technique. First, we adopted Little’s test to perform a missing value analysis to determine the pattern of the missing data. The data were seen to be missing completely at random ($p > 0.05$), and so we applied the multiple imputation technique to replace the missing data (Rubin, 1996). This allowed us to retain the original sample size and ensure that the participants’ responses were fully reflected in the analysis (Rubin, 1996).

Goodness of fit tests were used to evaluate the SEM models. The chi-square is the most traditional method for this, but is sensitive to large sample size (Bentler and Bonett, 1980). We therefore considered several other indicators: the normed fit index (NFI), the Tucker-Lewis incremental fit index (TLI), the comparative fit index (CFI), the relative/normed chi-square (CMIN/df), and the root mean square error of approximation (RMSEA). Using a multiple indicator approach in assessing the goodness of fit of the SEM model provides a more reliable model (Kline, 1998). We assessed the acceptability of the model by following Hu and Bentler (Hu L tze Bentler, 1999), who state that a SEM model has an acceptable fit to the data when NFI, TLI, CFI>0.90, CMIN<5, and RMSEA<0.08; and a good fit when NFI, TLI, CFI>0.95, CMIN<2, and RMSEA<0.06. We used the chi-square difference test to compare differences in model fit. Descriptive statistics were calculated using version 14 of Stata (StataCorp, 2015) and the SEM models were calculated using version 23 of SPSS Amos (Arbuckle, 2014).

3. Results

3.1. Descriptive statistics

Tables S1 and S2 in the appendix contain detailed information about the correlations, means, and standard deviations of gender harassment, illegitimate tasks, burnout, and depression among working adults in the

2018 and 2020 SLOSH data. Burnout increased from 4.8% at T1 to 7.9% at time T2 for men, and from 4.3% at time T1 to 6.8% at time T2 for women. Depression decreased slightly among men, from 3.2% at time T1 to 2.7% at time T2, but did not change substantially among women (4.5% at T1 to 4.3% at T2). Both gender harassment and illegitimate tasks were stable between T1 and T2 for both men and women. Apart from the correlations between gender harassment at T1 and depression at T2 for men, and gender harassment at T2 and depression at T2 for men, we found a weak but significant correlation between the exposure variables and the mental health outcomes. The patterns of the correlations were similar for both men and women.

3.2. Cross-lagged panel models

Tables 1A and 1B show the fit statistics ($\Delta\chi^2$, RMSEA, CFI, TLI, and NFI) of the four tested models. The results are presented separately below for burnout and depression.

3.2.1. Burnout

All four competing models that were estimated for the cross-lagged effect between gender harassment, illegitimate tasks, and burnout demonstrated an excellent fit to the data. However, the forward association model (Model 2) and the reverse association model (Model 3) both fitted the data significantly better than the stability model (Model 1) (Model 2: $\Delta\chi^2(31) = 40.91, p < 0.01$, Model 3: $\Delta\chi^2(30) = 11.96, p < 0.01$). The reciprocal model (Model 4) fitted the data significantly better than both Model 1 and Model 3; it also fitted the data better than Model 2, though not significantly. These results indicate that the reciprocal model (Model 4) was superior to all the competing models, and thus both forward and reverse association between the variables appeared to exist simultaneously.

3.2.2. Depression

Although all four competing models that were estimated for the cross-lagged relationship between gender harassment, illegitimate tasks, and depression showed a good fit to the data, the goodness of fit tests indicated that Model 4 ($\chi^2(120) = 204.99, RMSEA = 0.01, CFI = 0.999, TLI = 0.997, NFI = 0.997$) was superior to the other three models.

3.3. Standardized cross-lagged effects

The standardized cross-lagged effects between gender harassment, illegitimate tasks, and burnout/depression are shown in Table 2 and Fig. 3A and B. Initial gender harassment significantly predicted later burnout ($\beta = 0.046$), and initial burnout positively predicted later gender harassment ($\beta = 0.02$). Initial gender harassment also significantly predicted later depression ($\beta = 0.044$), but initial depression did not significantly predict later gender harassment.

Illegitimate tasks significantly predicted both burnout ($\beta = 0.071$)

Table 1A

Fit indices for all structural models in the relationship between gender harassment, illegitimate tasks, and burnout.

Model	χ^2	df	CMIN/df	RMSEA	CFI	TLI	NFI	Comparison	$\Delta\chi^2$	Δ df
Model 1	255.37	98	2.61	0.015	0.998	0.995	0.996			
Model 2	214.46	129	1.66	0.01	0.999	0.997	0.997	M2-M1	-40.91***	31
Model 3	243.41	128	1.9	0.011	0.999	0.996	0.997	M3-M1	-11.96***	30
Model 4	202.22	119	1.7	0.01	0.999	0.997	0.997	M4-M1	-53.15***	21
								M2-M4	12.24 n.s.	10
								M3-M4	41.19***	9
Model 5a	128.94	128	1	0.001	1	1	0.998	M5a-M1	-126.43***	30
Model 5 b	144.78	137	1.06	0.003	1	1	0.997	M5b-M1	-110.59***	39
Unconstraint (UM)	229.34	184	1.25	0.006	0.999	0.998	0.997			
Constraint (CM)	335.55	231	1.45	0.008	0.999	0.996	0.996	CM-UM	106.21***	47

Significance level: *** $p < 0.001$, ** < 0.05 , * < 0.10 ; n.s: non-significant.

Table 1B

Fit indices for all structural models in the relationship between gender harassment, illegitimate tasks, and depression.

Model	χ^2	df	CMIN/df	RMSEA	CFI	TLI	NFI	Comparison	$\Delta\chi^2$	Δ df
Model 1	249.99	99	2.53	0.015	0.998	0.995	0.996			
Model 2	215.19	129	1.67	0.01	0.999	0.997	0.997	M2-M1	-34.8***	30
Model 3	240.04	129	1.86	0.011	0.999	0.996	0.997	M3-M1	-9.95***	30
Model 4	204.99	120	1.71	0.01	0.999	0.997	0.997	M4-M1	-45***	21
								M2-M4	10.2 n.s.	9
								M3-M4	35.05***	9
Model 5a	139.05	128	1.09	0.004	1	1	0.998	M5-M1	-110.94***	29
Model 5 b	149.18	136	1.10	0.004	1	1	0.997	M5-M1	-100.81***	37
Unconstraint (UM)	223.96	184	1.22	0.006	0.999	0.998	0.997			
Constraint (CM)	304.46	231	1.32	0.007	0.999	0.997	0.996	CM-UM	80.5***	47

Significance level: *** $p < 0.001$, ** < 0.05 , * < 0.10 ; n.s: non-significant.

Table 2

Cross-lagged effects between gender harassment, illegitimate tasks, and mental ill-health outcomes.

Model	Cross-lagged path	Effect
Model 2	$GH_{T1} \rightarrow IT_{T2}$	0.042***
	$GH_{T1} \rightarrow BO_{T2}$	0.046***
	$IT_{T1} \rightarrow BO_{T2}$	0.071***
	$GH_{T1} \rightarrow DP_{T2}$	0.044***
	$IT_{T1} \rightarrow DP_{T2}$	0.075***
Model 3	$IT_{T1} \rightarrow GH_{T2}$	0.048***
	$BO_{T1} \rightarrow GH_{T2}$	0.02*
	$BO_{T1} \rightarrow IT_{T2}$	0.029**
	$DP_{T1} \rightarrow GH_{T2}$	0.016
	$DP_{T1} \rightarrow IT_{T2}$	0.034***
Model 4	$GH_{T1} \rightarrow IT_{T2}$	0.041***
	$GH_{T1} \rightarrow BO_{T2}$	0.046***
	$IT_{T1} \rightarrow BO_{T2}$	0.074***
	$IT_{T1} \rightarrow GH_{T2}$	0.048***
	$BO_{T1} \rightarrow GH_{T2}$	0.02*
	$BO_{T1} \rightarrow IT_{T2}$	0.027**
	$GH_{T1} \rightarrow DP_{T2}$	0.044***
	$IT_{T1} \rightarrow DP_{T2}$	0.078***
	$DP_{T1} \rightarrow GH_{T2}$	0.016
	$DP_{T1} \rightarrow IT_{T2}$	0.034***

Significance level: *** $p < 0.001$, ** < 0.05 , * < 0.10 ; GH: gender harassment; IT: illegitimate tasks; BO: burnout; DP: depression.

and depression ($\beta = 0.075$) over time. In the same vein, initial burnout ($\beta = 0.029$) and initial depression ($\beta = 0.034$) both predicted later illegitimate tasks.

Finally, gender harassment at time T1 significantly predicted illegitimate tasks at time T2 ($\beta = 0.042$), and illegitimate tasks at time T1 significantly predicted gender harassment at time T2 ($\beta = 0.048$).

3.4. Mediating effect

Results for the relationship between gender harassment at time T1 and mental health outcomes at time T2 via illegitimate tasks at time T2 and T1 are presented in Table 1A and Table 1B. The fit statistics for Model 5a ($\Delta\chi^2(30) = 126.43, p < 0.01$ and $\Delta\chi^2(29) = 110.94, p < 0.01$) and Model 5b ($\Delta\chi^2(39) = 110.59, p < 0.01$ and $\Delta\chi^2(37) = 100.81, p < 0.01$) demonstrated a significantly better fit to the data than stability model (Model 1). Although the bias-corrected bootstrapping revealed that the mediating effect of illegitimate tasks at time T2 in the relationship between gender harassment at time T1 and burnout at time T2 was not statistically significant ($\beta = 0.003, 95\% \text{ CI: } 0.001-0.012$), the mediating effect of illegitimate tasks at T1 in the relationship between

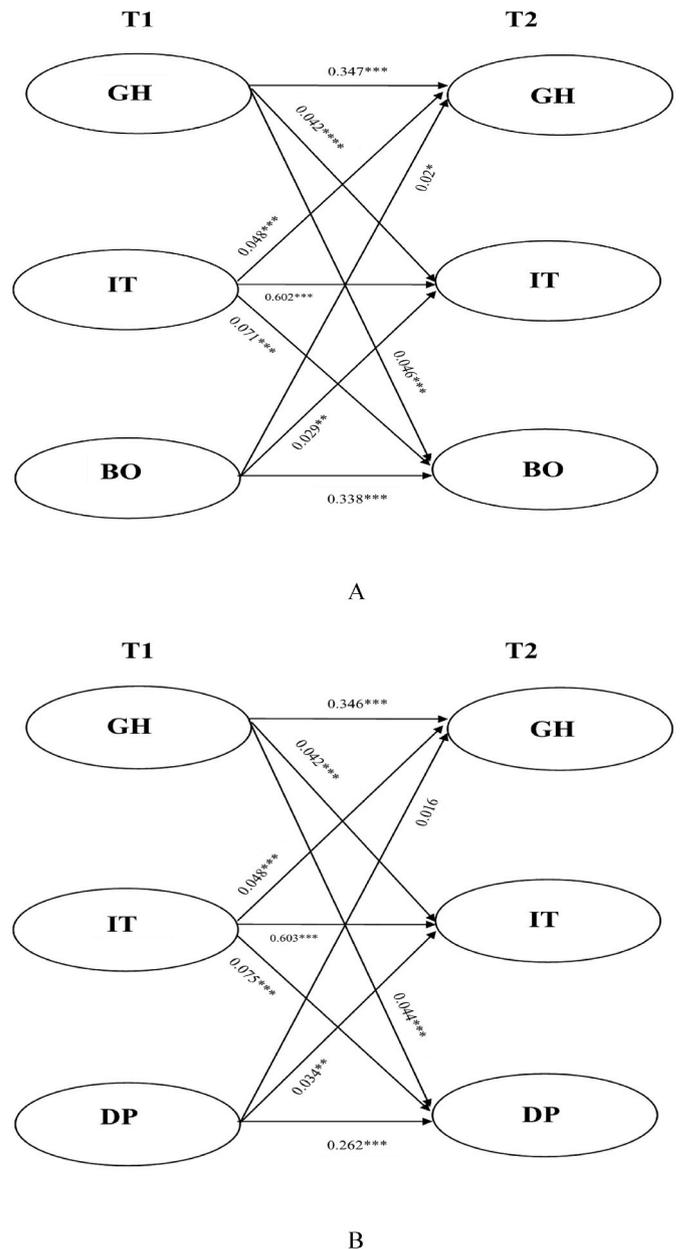


Fig. 3. A. Standardized cross-lagged effects between gender harassment (GH), illegitimate tasks (IT), and burnout (BO) in Swedish workers. B. Standardized cross-lagged effects between gender harassment (GH), illegitimate tasks (IT), and depression (DP) in Swedish workers.

gender harassment at time T1 and burnout at time T2 was statistically significant ($\beta = 0.025$, 95% CI: 0.014–0.051). Similarly, illegitimate tasks at time T2 did not mediate the relationship between gender harassment at time T1 and depression at time T2 ($\beta = -0.002$, 95% CI: 0.009–0.003), but illegitimate tasks at time T1 mediated the relationship between gender harassment at time T1 and depression at time T2 ($\beta = 0.016$, 95% CI: 0.007–0.028).

3.5. Multigroup analysis results: gender difference

Multigroup analyses were performed to determine the gender difference in the relationship between gender harassment, illegitimate tasks, and adverse mental health outcomes. Since, as mentioned earlier, Model 4 showed the best fit statistics, this model was used for the multigroup analysis. Tables 1A and 1B provide detailed information on the unconstrained and constrained model from the multigroup analysis. Our analysis showed an excellent fit of the data for both the constrained and unconstrained model. The chi-square difference score revealed a statistically significant gender difference in the cross-lagged models estimating relationships between gender harassment, illegitimate tasks, and both burnout ($\Delta\chi^2(47) = 106.21, p < 0.01$) and depression ($\Delta\chi^2(47) = 80.5, p < 0.01$).

We therefore proceeded to estimate the gender difference in the effect for each path. Table 3 S3, and S4 give detailed information on gender differences in the longitudinal effects. There was a significant gender difference in the direct effect of gender harassment on illegitimate tasks over time ($\Delta\chi^2(1) = 6.29, p < 0.05$), with the effect appearing to be stronger for men ($\beta = 0.066, P < 0.01$) than for women ($\beta = 0.03, P < 0.05$). Illegitimate tasks significantly predicted burnout across time among women ($\beta = 0.11, P < 0.01$) but not among men. There was also a significant gender difference in the longitudinal effect of illegitimate tasks on depression across time ($\Delta\chi^2(1) = 3.28, p < 0.10$); this effect was weaker among men ($\beta = 0.053, P < 0.05$) than among women ($\beta = 0.09, P < 0.01$). Gender harassment significantly predicted burnout over time among women ($\beta = 0.06, P < 0.01$) but not among men. Furthermore, the direct effect of gender harassment on depression across time differed significantly by gender ($\Delta\chi^2(1) = 4.7, p < 0.05$); this effect was stronger among men ($\beta = 0.078, P < 0.01$) than women ($\beta = 0.031, P < 0.10$). Conversely, there was no significant gender difference in the direct effect of mental health outcomes on illegitimate tasks and gender harassment across time.

4. Discussion

This study investigated gender differences and inter-directional effects between gender harassment, illegitimate tasks, and mental ill-health outcomes in a national cohort of the working population in

Table 3
Cross-lagged effects between gender harassment, illegitimate tasks, and mental ill-health outcomes, divided by gender.

Cross-lagged path	Effects	
	Men	Women
$GH_{T1} \rightarrow IT_{T2}$	0.066***	0.03**
$IT_{T1} \rightarrow BO_{T2}$	0.012	0.11***
$GH_{T1} \rightarrow BO_{T2}$	0.006	0.06***
$BO_{T1} \rightarrow IT_{T2}$	0.031	0.025
$BO_{T1} \rightarrow GH_{T2}$	0.019	0.018
$IT_{T1} \rightarrow GH_{T2}$	0.023	0.066
$IT_{T1} \rightarrow DP_{T2}$	0.053**	0.090***
$GH_{T1} \rightarrow DP_{T2}$	0.078***	0.031*
$DP_{T1} \rightarrow IT_{T2}$	0.036	0.034
$DP_{T1} \rightarrow GH_{T2}$	0.025	0.012

Significance level: *** $p < 0.001$, ** < 0.05 , * < 0.10 ; GH: gender harassment; IT: illegitimate tasks; BO: burnout; DP: depression.

Sweden. Statistically significant cross-lagged relationships were seen between gender harassment, illegitimate tasks, and mental ill-health in terms of burnout and depression. There were statistically significant gender differences in these cross-lagged effects. Initial but not later illegitimate tasks mediated the relationship between gender harassment and mental ill-health outcomes across time. To our knowledge, this is the first study to simultaneously assess the bidirectional effects between gender harassment, illegitimate tasks, and mental ill-health outcomes among working adults.

Cross-lagged relationship between gender harassment, illegitimate tasks, and mental ill-health.

In line with previous studies (Leskinen et al., 2011; Muhonen, 2016; Berdahl et al., 1996; Garcia Johnson and Otto, 2020), our findings confirmed H1a that initial gender harassment may directly affect both burnout and depression over time. These findings may be attributed to the fact that gender harassment may communicate insulting, humiliating, degrading, and contemptuous conduct against one's gender (Fitzgerald et al., 1995; Gelfand et al., 1995; Leskinen et al., 2011), which may subsequently have detrimental mental health effects (Leskinen et al., 2011). Regarding H1b (burnout/depression to gender harassment), our results showed unexpected patterns. While initial burnout marginally predicted gender harassment across time, depression did not have a statistically significant effect on gender harassment over time. Thus, reverse association played only a minor role. Schacter and Juvonen (2017) argued that symptoms from depression and other negative mental health outcomes may signal vulnerability for peers to engage in negative reactions. Previous studies among the working population are not available for comparison to our results. Skoog and Kapetanovic [52] used data from the Longitudinal Research on Development in Adolescence (LoRDIA) to investigate sexual harassment and adverse mental health in Sweden and found that well-being negatively predicted sexual harassment over time. However, unlike the present study's focus on gender harassment alone, their study conflated gender harassment, unwanted sexual attention, and sexual coercion. The Fitzgerald tripartite model of sexual harassment (Fitzgerald et al., 1995; Gelfand et al., 1995) suggests that because of the higher frequency of gender harassment in comparison to the other forms of harassment, it is important to disentangle the effects of these exposures in order to develop effective public health strategies and policy interventions. One possible explanation for our unexpected findings is that although burnout and depression may have triggered a risk for gender harassment in the same or the following year, their effects could have diminished across the two-year time horizon. Concerning the reciprocal effects, we found a statistically significant reciprocal relationship between burnout and gender harassment but not depression and gender harassment. The possibility of a bi-directional effect between gender harassment and mental ill-health is important, but unlike our study, most studies among the working population have ignored it.

Our findings provide strong support for H2a that illegitimate tasks may predict later mental ill-health outcomes including burnout and depression. Like previous studies (Semmer et al., 2010, 2015; Omansky et al., 2016; Eatough et al., 2016), our findings support the SOS theoretical framework which suggests that illegitimate tasks may be linked to negative psychological outcomes (Semmer et al., 2010, 2015; Eatough et al., 2016). Our results may be due to illegitimate tasks serving as an identity-relevant stressor which poses a threat to an employee's professional role (Thoits, 1991), belongingness, self-worth, and self-esteem, which in turn has detrimental mental health effects (Semmer et al., 2010, 2015). The current study also confirmed H2b that initial experience of mental ill-health may predict illegitimate tasks across time. This is inconsistent with a previous longitudinal study showing that mental ill-health in terms of feelings of resentment and irritability did not predict illegitimate tasks over time (Semmer et al., 2015). Apart from the reverse association, the present study found a reciprocal relationship between illegitimate tasks and mental ill-health outcomes. These findings provide new insights and expand the SOS

theoretical framework (Semmer et al., 2007, 2010, 2015) by empirically demonstrating that not only do illegitimate tasks predict mental ill-health outcomes, but there is reverse and reciprocal association between illegitimate tasks and adverse mental health outcomes.

Our results on H3a corroborate previous findings that gender harassment significantly predicted the occurrence of later illegitimate tasks (García Johnson and Otto, 2020), but we also found that illegitimate tasks predicted the occurrence of gender harassment over time, confirming H3b. More specifically, higher levels of gender harassment may lead to higher levels of illegitimate tasks and vice versa. The relationship between gender harassment and illegitimate tasks can co-occur, indicating a bi-directional relationship. Illegitimate tasks may serve as a disguised form of gender harassment (García Johnson and Otto, 2019, 2020), but gender harassment may also be used as a disguised form of illegitimate tasks, for daring to break stereotypical gender norms or for not conforming to gender roles. In effect, both gender harassment and illegitimate tasks may be used as a mechanism to prevent career progression for gender minorities. Although one cross-sectional study has provided evidence of a direct association of gender harassment on illegitimate tasks (García Johnson and Otto, 2020), the present longitudinal results provide novel revelations of forward, reverse, and reciprocal effects over time.

4.1. Mediating effects of illegitimate tasks

Contrary to our expectation (H4a), the prediction of later mental ill-health outcomes by initial gender harassment was not significantly mediated by later illegitimate tasks. Nevertheless, H4b which assumes that initial illegitimate tasks will mediate the relationship between initial gender harassment and later mental ill-health was confirmed. These findings are striking, given Johnson and Otto's (García Johnson and Otto, 2020) conclusion that illegitimate tasks may play a significant role in the relationship between gender harassment and mental ill-health. The latter study was cross-sectional, while the present study was longitudinal. Moreover, Johnson and Otto (García Johnson and Otto, 2020) operationalised gender harassment as sexist hostility and ignored other dimensions of gender harassment such as crude harassment and gender policing (Leskinen and Cortina, 2014; Fitzgerald et al., 1995); conversely, we used a multidimensional construct including all forms of gender harassment. In proposing the use of such a multidimensional approach, Leskinen and Cortina (2014) argued that conceptualization of gender harassment should expand to include unique experience of harassment, and that using one dimension to conceptualise harassment may be premature. A possible explanation for our findings is that illegitimate tasks may take time to trigger mental ill-health. Illegitimate tasks did not significantly predict mental ill-health in the same year (results not shown) but triggered mental ill-health over time.

4.2. Gender difference in cross-lagged effects

As gender role theory posits that men and women have different social roles and norms, and that society expects them to conform to them (Eagly et al., 2000), we expected to find some gender differences in the way our participants perceived and reacted to gender harassment and illegitimate tasks (Muhonen, 2016; Berdahl et al., 1996; Semmer et al., 2015; Omansky et al., 2016; Settles et al., 2011, 2014). Overall, we saw significant gender differences in the cross-lagged models estimating the relationship between gender harassment, illegitimate tasks, and mental ill-health outcomes. We therefore proceeded to explore the gender differences for each cross-lagged effect. Gender harassment significantly predicted later burnout among women but not among men. Nevertheless, it also significantly predicted later depression as well as illegitimate tasks for both men and women, with the effect appearing stronger among men than among women. In line with a few previous studies (Settles et al., 2011, 2014), the general pattern of these effects suggests

that men respond more strongly and negatively to gender harassment than women. This is in contrast to the cross-sectional studies by Berdahl et al. (Berdahl et al., 1996) and Muhonen (2016), who found that the association between gender harassment and mental ill-health outcomes was stronger among women than men. The model of harassment posits that both men and women engage in harassment to obtain dominance and maintain power over vulnerable peers (Berdahl et al., 1996). However, there is a power gap between men and women, because of the societal expectation of gender norms where women are expected to be submissive while men are expected to be dominant. The observed gender difference in our study might be related to expectation violation theory, which suggests that people react strongly and negatively when their expectations are unmet or violated (Burgoon, 1993). For example, because men are more prone to perpetrate gender harassment than women, they may not expect to be harassed, and the violation of this expectation may lead to higher levels of adverse mental health outcomes than among women who are used to (and may anticipate) harassment (Settles et al., 2014). Apart from the negative health outcomes, expectation violation theory explains why gender harassment predicted later illegitimate tasks more strongly in men than women in our study.

The authors of a cross-sectional study conducted among the working population in the USA (Omansky et al., 2016) speculated that women are more communal, nurturing, and giving, and hence are expected to adhere to and feel less threatened by illegitimate tasks; while men are more dominant, agentic, and ambitious and therefore may feel more threatened by these tasks. We therefore expected men to react more strongly to illegitimate tasks than women. However, our study indicated that illegitimate tasks significantly predicted later burnout among women but not men. Furthermore, the longitudinal effect of illegitimate tasks on depression across time was significantly stronger among women than men. These findings are in contrast to the abovementioned cross-sectional study (Omansky et al., 2016), which found that the negative association of illegitimate tasks on both job satisfaction and intrinsic motivation was stronger among men than women. One reason for this difference in findings could be differences in context between Sweden, where our study was conducted, and the USA. There is widespread evidence that despite the gains made over the years in reducing gender inequality in the USA, it is still pervasive (England et al., 2020). Conversely, Sweden is a strong promoter of gender equality (Linde). It is therefore likely that, in comparison to their American counterparts, women in Sweden may feel more provoked by carrying out illegitimate tasks and react more strongly to this.

4.3. Strengths, limitations, and future studies

A major strength of our study is the use of data from a nationally representative cohort study based on the Swedish Longitudinal Occupational Survey of Health (SLOSH). However, caution is needed in generalising the findings, since non-response has led to the inclusion of a more selected group of people in the study participants. The selected group had higher levels of education and were older than the general working population in Sweden, and women were over-represented. Another strength is that we extended previous findings by showing that gender harassment not only affects health outcomes among workers, but may lead to illegitimate tasks which affect workers' professional roles and identities. Further, we used a multiple imputation technique to estimate missing values which made our results more robust. Finally, our study was strengthened by the rigorous analytical modelling technique used to predict the effects for the multiple pathways over time.

The study also has limitations. First, the exposures and outcomes were based on self-reporting which may be biased and lead to over-estimation. Nevertheless, using self-reporting to estimate adverse mental health outcomes may provide more valid and valuable measurements (Howard, 1994). Secondly, biological and behavioural variables were not included as control variables. Still, the social factors that

we did control for are important social determinants of health outcomes (Rieker and Bird, 2005). Thirdly, due to lack of data, workplace changes between SLOSH waves were not included as covariates. However, it is possible that workers who experience workplace changes such as gender harassment or illegitimate tasks or negative ill-health in 2018 may subsequently change or quit their job in 2020, and this may underestimate the results of the findings (Jensen et al., 2018). We have used two different time points for our measurements and added both hypothesized and reversed paths in our models, thus investigating reciprocal associations between our variables, while also adjusting for cross-sectional association. This adds to the stability of our model and results. However, because all measures were self-reported, we cannot completely rule out that common method variance affected the results with inflated associations as a consequence (Tehseen et al., 2017).

The two SLOSH waves represent very different situations on the labour market (pre-pandemic and during pandemic), and working life post covid-19 is rapidly changing to include more remote and less on-site work. To what extent the results of the present study can be generalised to consequences of workplace gender harassment across labour market sectors in the new hybrid working life needs to be explored in future studies. Also, future studies could consider the potential buffering effects of coping mechanisms in the relationship between gender harassment/illegitimate tasks and adverse mental health outcomes. We recommend future research into other plausible mediating variables such as job stress, social support, and work-life conflict that may influence the inter-relationship between gender harassment, illegitimate tasks, and mental ill-health.

4.4. Policy implications

Our study highlights the importance of policy interventions and strategies aimed at reducing gender harassment, illegitimate tasks, and gender differences in the workplace. Government, organisations, and policy makers must ensure that policies to reduce sexual harassment include not only predatory sexual conducts, but also gender harassment, which occurs commonly and may create a hostile work environment. Gender harassment is an organisational problem (Bildt, 2005), and so it is crucial for organisations to focus on their organisational measures such as environment, structure, process, and practices to address sexist climate, crude behaviour, and other forms of gender harassment. Offering workshops, seminars, conference, and training to managers and supervisors who assign work tasks helps to ensure they understand the “social messages” they send to workers when assigning tasks (Semmer et al., 2015). Awareness of gender roles and norms is a step in the development of effective policies, strategies, and interventions to address gender harassment and illegitimate tasks in organisations. Interventions and strategies implemented to reduce these exposures must be tailored to benefit both men and women in different contexts.

5. Conclusion

This study provides new prospective evidence for cross-lagged relationships between gender harassment, illegitimate tasks, and burnout and depression among working adults in Sweden, with gender playing a differential role. Although later illegitimate tasks did not mediate the link between initial gender harassment and later adverse mental health, initial illegitimate tasks did mediate the relationship. Thus, illegitimate tasks may be used as a disguised form of gender harassment to prevent targets from career progression over time. To improve both mental health and the working environment, effective policies and regulations addressing harassment and illegitimate tasks should be implemented.

Credit author statement

Conception and design of the study: Aziz Mensah, Susanna Toivanen, Anna Nyberg, and Martin Diewald. Methodology, Analysis, software:

Aziz Mensah. Manuscript draft: Aziz Mensah. Interpretation of data and revising manuscript: All authors. Supervision: Martin Diewald, Susanna Toivanen, and Anna Nyberg. All authors read and gave their approval for publication of the final manuscript.

Data availability

The data that has been used is confidential.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2022.115520>.

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