



Long Working Hours, Precarious Employment and Anxiety Symptoms Among Working Chinese Population in Hong Kong

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Abstract

This study aimed to examine the association between working hours and anxiety of a working population in Hong Kong. We used a cross sectional data from a population-based household survey of Hong Kong Chinese adults. Key measures included employment status, skill level, working hours, length of stay at current job and anxiety level. Symptoms of anxiety were assessed using the Depression Anxiety Stress Scale (DASS-21). The data were analysed using logistic regression. Chinese adults who had long working hours (≥ 72 h per week) had higher odds of developing symptoms of anxiety than those who worked for ≤ 36 h per week (odds ratio [OR] 5.94, 95% confidence interval [CI]: 1.82–19.41). Compared with short period (< 1 year), long period of stay at current job (≥ 5 years) was found as a protective factor from anxiety (OR 0.38, 95% CI: 0.20–0.73). We found that a working period of 72 h per week was a significant threshold to cause anxiety to workers. Stable job arrangement was a protective factor to workers from anxiety. Implementation of labour market regulations, such as standard working hour policy and stable job arrangement, was also significant to mitigate risk of anxiety for working people in Hong Kong.

Keywords Working hours · Anxiety · Mental health · Precarious employment · Hong Kong

Introduction

Recent social science studies report growing concerns regarding the relationship between health-related and employment-related factors [1–4]. Given the pressure to boost productivity and competitiveness under global neo-liberalisation and financialization [5–7], increasing risks and costs of enterprises are transferred to workers because of the bias of employment relations towards employers. Consequently, working hours are increasingly becoming a risk of mental health for employees [8].

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Whilst work intensity ascends across industries and countries [9], considerable research also reveal complexities about the influence of working overtime on physical and mental health outcomes. Firstly, long working hours may lead to unfavourable health conditions; however, working overtime may also be associated with high income and status, which may mediate the negative outcomes [10]. Secondly, gender is found to be a key risk factor. Women working longer hours have higher risks of mental health problems than those working for normal hours due to their gendered family duties [10–12]. On the contrary, Driesen et al. [13] suggested that long working hours can be negatively correlated with mental problems for men but not for women. The gendered patterns of the relationship between working hours and mental health outcomes are seemingly inconsistent. Thirdly, organisational positions and work attitudes shape workers' acceptance of and feelings towards their work [14]. This condition complicates the measurement of the influence of working hours on mental health. Fourthly, Kameräde et al. [15] showed that working between one and eight hours per day have positive effects on the previously economically inactive or unemployed workers' mental health and well-being. They also found no evidence of optimal working hours for improving mental health and well-being and argued that the differences of mental health outcomes between the shortest and longest working hour groups are limited in the UK.

In a systematic review of health-related literature, Bannai and Tamakoshi [16] suggested that working more than 40 h per week adversely affect the level of anxiety symptoms, despite the contextual differences in the definition of long working hours. In addition to cross-sectional research, Virtanen et al. [10] explored the effect of long working hours on the symptoms of anxiety via a longitudinal analysis of middle-aged civil servants in the UK. They argued that working more than 55 h per week showed higher risk of anxiety symptoms than working between 35 and 40 h per week. Afonso et al. [17] adopted the Hospital Anxiety and Depression Scale (HADS) and found stronger symptoms of depression and anxiety from the long working hours group with more than 48 h per week than the regular working hours group. Interestingly, working time is also positively related with higher within-firm positions and the HADS scores. Long working hours are not necessarily restricted to low-skill or low-status jobs. Artazcoz et al. [18] showed that job quality has failed to explain the negative mental health outcomes of employees in 27 European Union countries. Although working overtime is also found to be positively associated with anxiety [19], this relationship has received less attention than that of depression and overwork.

As the demographic characteristics and the institutional contexts filter the effects of working hours on mental health outcomes, the findings about the relationship between working hours and mental health outcomes can vary across social settings (Ganster, Rosen, & Fisher, 2018). Professional occupations account for most of the jobs with long working hours in Japan, whereas low-paid and low-skilled jobs are mainly associated with overwork in China [7]. Hence, policy contexts set the scene of studying working hours and mental health outcomes. Surprisingly, this subject is considerably understudied in Hong Kong where employers gain strong power to determine the scheduling of employees' working time and hours in the absence of standard working hours legislation and collective bargaining. Previous research showed that long working hours in Hong Kong adversely affect family leisure activities and family functioning [20]. Moreover, overwork coupled with few sleeping hours is associated with obesity, especially for men in Hong Kong [21].

The working hours in Hong Kong are on the high side internationally. The statistics of the International Labour Organization (ILO) has shown that the average working hours in Hong Kong are 42 h per week in 2018, which are longer than most of the selected advanced places, including South Korea, Japan, the UK and Germany (Legislative Council [22]. Low-skilled

workers, such as security guards, elderly home workers, and craft and machine workers, are prone to long working hours. For example, more than 25% of the workers in estate management, security and cleaning services sectors have worked at least 60 h per week in 2019 [23]. The legislation of standard working hours in Hong Kong is still under debate. Although voluntary industry guidelines are implemented, no legislation on standard working hours is being put forward (Legislative Council [22]). In line with the above literature review, this research contributes in two ways. This research aims to investigate the associations amongst working hours, job status, and mental health outcomes in Hong Kong. This research also examined the correlation between actual working hours and anxiety symptoms across sex and occupational differences.

Methods

Data Collection

The data used in this study were collected from the project titled ‘Trends and Implications of Poverty and Social Disadvantages in Hong Kong: A Multi-Disciplinary and Longitudinal Study’. The project was a cross-sectional study with random sampling. Firstly, 25,000 addresses were obtained from the Census and Statistics Department of Hong Kong. Secondly, the samples were stratified by the residents’ location and housing types. The respondents were adults aged 18 and above living in Hong Kong. Thirdly, face-to-face interviews were conducted by professionally trained interviewers to obtain responses. A total of 3,791 valid cases were obtained in this study, with a response rate of 60.2%. Amongst the total of 2,282 adults successfully interviewed, 1,978 of them were asked to answer the questions related to employment and mental health. For the analysis, the respondents who were economic inactive, including students, retired people and housewives, were excluded. Finally, a total of 1,058 economic active cases were selected, and these respondents were chosen as the sample in this study.

Measures

Dependent Variables The anxiety subscale of the Depression Anxiety Stress Scale (DASS-21) was used to measure the respondents’ anxiety level. DASS-21 scale was composed of 21 validated items for self-assessment. A higher (vs. lower) score implied more (vs. less) severe symptoms of mental fitness [24]. A validated Chinese-translated version of DASS-21 was used in this study [25]. The respondents were asked to what extent they agree with the statements in the past week on a four-point rating scale, from 0 (did not apply) to 3 (applied most of the time). The respondents’ level of anxiety was measured using ‘normal’ (0–7), ‘mild’ (8–9), ‘moderate’ (10–14), ‘severe’ (15–19) and ‘extremely severe’ (≥ 20) subscales [26]. In this study, the DASS anxiety subscales were further divided into two groups for logistic regression modelling. The cases with anxiety level from ‘mild’ to ‘extremely severe’ were categorised as those ‘with anxiety’.

Work-Related Explanatory Variables

Employment Status The economic population is divided into four groups of current employment status: ‘permanent employees’, ‘casual employees’, ‘contractual employees,’

and 'unemployed'. Casual employees were those employed on a day-to-day basis for a fixed period less than 60 days. Contractual employees were cases employed for a fixed period more than or equal to 60 days.

Skill Level The respondents' current or last job was classified based on the four International Standard Classification of Occupation 2008 (ISCO-08) skill levels of the ILO: elementary occupations and others (Skill Level 1); clerical support workers, service and sales workers, craft and related workers, plant and machine operators and assemblers (Skill Level 2); and managers and administrators, professionals and associate professionals (Skill Level 3 or 4).

Working Hours The respondents' working hours per week, including overtime, were recorded. They were divided into four groups: ≤ 36 h, 37–59 h, 60–71 h, and ≥ 72 h. The threshold of 72 h was purposefully chosen for those who worked extremely working hours at a pattern of 12 h a day and 6 days a week in Hong Kong. Most of them were cleaners, security guards and caregivers.

Length of Stay at Current Job The respondents were asked 'How long have you been doing this job?' to measure their length of stay at current jobs, which was categorised into three groups: < 1 year, 1–4 years and ≥ 5 years.

Sociodemographic Covariates The respondents' demographic and socioeconomic background, including sex, age, educational level and marital status, was used for the analysis. These variables were divided into groups for logistic regression. Sex was either 'male' or 'female'. Age was divided into three groups: '18–40 years', '41–59 years,' and ' ≥ 60 years'. Educational level was divided into 'primary,' 'secondary,' and 'tertiary or above'. Finally, marital status was divided into 'married/cohabiting' and 'single/separated/divorced/widowed'.

Income level exhibited influence on the respondents' mental health level and was controlled in the analysis. The equalised household income (EHI) was used to measure income poverty. EHI was calculated by dividing the total household income by the square root of the number of household members. In this sample, the cases with a monthly EHI less than the median monthly EHI of the working group (HKD 7,216.9) were considered income poor for the analysis.

Statistical Analysis

To enhance the representativeness of the sample, the data used was weighted in accordance with the sex and age distribution in the Hong Kong census data in mid-2014. The descriptive statistics was presented, including the respondents' demographic background, income poverty situation, employment characteristics and anxiety level. Then, multilevel logistic regression was performed with DASS-Anxiety being the dependent variable (DV). A three-level regression was performed, where the demographic information and income were included in the first level, employment background, including employment status and skill level, was added in the second level, and working situation, including working hours and length of stay at current job, were used as imputed in the third level to measure their effects on the respondents' anxiety level.

Results

Demographic and Socioeconomic Characteristics

The sample was composed of 56.9% male and 43.1% female. Age groups 18–40 years, 41–59 years and ≥ 60 represented 49.3%, 44.1% and 6.6% of the sample, respectively. The respondents with primary, secondary, and tertiary or above education levels accounted for 12.3%, 62.8%, and 24.9%, respectively. The respondents who were married or cohabited accounted for 62.7%, whereas those who were single, separated, divorced, or widowed accounted for 37.3% (Table 1). EHI was used to measure the respondents' economic status and poverty situation. The mean value of EHI was HKD 16,205 (SD=9,111), and 8.9% of the respondents were in relative income poverty (Table 1).

Table 1 Demographic information and employment situation of respondents

		Weighted %	N
Sex (N= 1058)	Male	56.9	602
	Female	43.1	457
Age (N= 1058)	18–40	49.3	521
	41–59	44.1	467
	≥ 60	6.6	70
Educational Attainment (N= 1053)	primary	12.3	130
	secondary	62.8	662
	tertiary or above	24.9	262
Marital status (N= 1057)	Married/cohabit	62.7	663
	Single/separated/divorces/widowed	37.3	394
Income Poverty (N= 1001)	Income Poor	8.9	89
	Income non-poor	91.1	912
Employment Status (N= 1058)	Current Permanent Employee	68.6	726
	Current Casual Employee: employ on day-to-day basis/for a fixed period < 60 days	16.3	173
	Current Contract Employee: employ for a fixed period > 60 days	9.4	99
	unemployed	5.7	60
Skill Level (N= 1047)	skill level 1	21.6	227
	skill level 2	55.6	582
	skill level 3 to 4	22.8	238
Working Hour per week (N= 1026)	36 or below	16.8	173
	37–59	63.3	649
	60–71	15.4	158
	72 or above	4.5	46
Length of stay at current job (year) (N= 1047)	below 1	14.4	151
	1–4	40.9	428
	5 or above	44.7	468

Table 2 Mental health situation:
Anxiety DASS-score

	Mean	SD
DASS – Anxiety Score (N = 1055)	0.925	2.141
	Weighted %	N
DASS – Anxiety: Normal	90.5%	955
DASS – Anxiety: Mild / Moderate / Severe / Extreme Severe	9.5%	100

Employment Characteristics

The respondents were composed of permanent employees (68.6%), casual employees (16.3%), contractual employees (9.4%), and unemployed (5.7%). For occupation, 21.6% of them were in skill levels 1, 55.6% were in skill level 2, and 22.8% were in skill level 3 or 4. The respondents who worked for ≤ 36 h, 37–59 h, 60–71 h, and ≥ 72 h accounted for 16.8%, 63.3%, 15.4%, and 4.5%, respectively. The respondents who worked < 1 year, 1–4 years, and ≥ 5 years at their current jobs accounted for 14.4%, 40.9%, and 44.7%, respectively (Table 1).

Anxiety

The mean value of DASS-Anxiety was 0.925 (SD = 2.141). 90.5% exhibited normal levels of anxiety, whereas 9.5% exhibited mild, moderate, severe or extremely severe levels of anxiety (Table 2).

Probability of Anxiety

Logistic regression analysis was performed to examine the influence of various independent variables on anxiety level. In the univariate model, sex, income poverty, employment status, working hours, and length of stay at current job were significantly associated with anxiety. In Model 1, only sex showed significant effect on anxiety, while age, educational level, and marital status did not exhibit any significant effect. Females showed higher risk of being anxious than males (adjusted odds ratio [OR] 1.76, 95% confidence interval [CI]: [1.19–2.73]). Moreover, income poverty showed significant and large effect on anxiety. Those regarded as income poor were nearly four times more likely to develop anxiety than those with stable income (adjusted OR 3.92, 95% CI: [2.25–6.85]). The effect of income poverty was found critical with large effect in all models. In Model 2, permanent employment was used as reference group for employment status. Those who were casually employed showed significant and lower risk of being anxious (adjusted OR 0.47, 95% CI: [0.23–0.98]). However, skill level failed to exhibit significant effect on anxiety level amongst all models.

In Model 3, all independent variables were used in the multivariate model. For working hours, 36 h or below was used as a reference group. Those who worked for ≥ 72 h per week exhibited significant higher risk to develop anxiety (adjusted OR 5.94, 95% CI: [1.82–19.41]). This effect was higher than that in the univariate model (crude OR 2.95, 95% CI: [1.14–7.65]). In terms of length of stay at current job, compared with those worked < 1 year, those who worked for 1–4 years (adjusted OR 0.46, 95% CI: [0.26–0.83]) and ≥ 5 years (adjusted OR 0.38, 95% CI: [0.20–0.73]) at their current jobs showed lower risk of being anxious, respectively (Table 3).

Table 3 Logistic Regression Model (DV: DASS – Anxiety)

Variables	Univariate model Crude OR 95% CI	Model 1 Adjusted OR 95% CI	Model 2 Adjusted OR 95% CI	Model 3 Adjusted OR 95% CI
Demographic and socioeconomic				
Gender				
Male	1	1	1	1
Female	1.80(1.19–2.73)**	1.76(1.15–2.71)*	2.01(1.29–3.13)**	2.25(1.41–3.60)**
Age				
18 to 40	1	1	1	1
41 to 59	0.92(0.60–1.41)	0.88(0.53–1.45)	0.90(0.54–1.51)	1.16(0.67–2.01)
> = 60	0.70(0.27–1.81)	0.60(0.20–1.78)	0.69(0.23–2.07)	0.98(0.31–3.15)
Education				
primary	1	1	1	1
secondary	0.86(0.46–1.61)	0.83(0.42–1.64)	0.73(0.36–1.46)	0.68(0.33–1.41)
tertiary or above	0.94(0.47–1.89)	0.98(0.43–2.23)	1.09(0.45–2.65)	1.00(0.40–2.50)
Marital Status				
Married/cohabit	1	1	1	1
Single/separated/ divorces/widowed	1.23(0.81–1.87)	1.04(0.65–1.66)	0.97(0.60–1.56)	1.09(0.66–1.81)
Working Income poverty				
NOT income poor	1	1	1	1
Income poor	3.67(2.15–6.28)***	3.92(2.25–6.85)***	3.77(1.97–7.20)***	3.93(2.02–7.67)***
Employment Situation				
Employment Status				
Permanent Employee	1	1	1	1
Casual Employee	0.74(0.39–1.43)		0.47(0.23–0.98)*	0.58(0.24–1.38)

Table 3 (continued)

Variables	Univariate model Crude OR 95% CI	Model 1 Adjusted OR 95% CI	Model 2 Adjusted OR 95% CI	Model 3 Adjusted OR 95% CI
Contract Employee	1.32(0.67–2.59)		1.15(0.56–2.35)	1.01(0.46–2.22)
Unemployed	3.09(1.60–5.97)**		2.14(0.98–4.70)	1.81(0.78–4.19)
Skill Level				
Skill level 1	1	1	1	1
Skill level 2	1.34(0.79–2.29)		1.43(0.79–2.60)	1.67(0.90–3.10)
Skill level 3 to 4	0.78(0.40–1.56)		0.80(0.35–1.83)	0.98(0.41–2.35)
Working Hour per week				
36 or below	1			1
37–59	1.35(0.71–2.57)			1.76(0.77–4.03)
60–71	1.68(0.78–3.62)			2.08(0.81–5.31)
72 or above	2.95(1.14–7.65)**			5.94(1.82–19.41)**
Length of stay at current job				
below 1	1			1
1–4	0.41(0.24–0.69)**			0.46(0.26–0.83)*
5 or above	0.32(0.19–0.54)***			0.38(0.20–0.73)**

Significant level, Odd ratio (OR) and 95% confidence interval (CI) for DASS-Anxiety. Model 1 = demographic and socioeconomic factors; Model 2 = Model 1 + employment status and skill level; Model 3 = Model 2 + working hour and length of stay at current job

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Discussion

The results revealed several risk and protective factors of anxiety that were worth comparing with the existing literature. Amongst the demographic factors, only sex was a risk factor of anxiety. This finding was coherent with previous studies, which found that sex was a risk factor of mental health problems and females were more likely to develop anxiety than males [10, 12]. However, this finding was different from that of Driesen et al. [13]. One possible explanation was that females had heavier family care responsibilities in the Chinese context. The role of family carer put much pressure on them in daily life. On the other hand, income poverty was a significant risk factor of anxiety with high level of effect. This finding echoed previous research that highlighted the negative association between income and anxiety level [27, 28]. Moreover, we showed that those regarded as income poor were nearly four times more likely to suffer from anxiety than those income non-poor. This highlighted the critical impact of income poverty on mental health. Since the income poverty rate in Hong Kong remained high (20.4%) and more than 1.4 million people were living under income poverty [29], more policy interventions on income enhancement are needed to reduce the anxiety faced by the poor families.

Unemployment was a risk factor in univariate model, but it was non-significant in the multivariate models. One possible reason was that the effect of unemployment was reduced after controlling for income poverty. Previous study showed that unemployed and economically inactive people exhibited higher risk of having mental disorders than those employed and economically active [30, 31]. One possible explanation was that the effect of unemployment on anxiety may come from low level of income but not from employment status, but it needs further research for studying the reasons behind. For skill level, previous study suggested that low occupational skill levels were associated with poor mental health [32]. In this study, the effect of skill level on anxiety was non-significant in the univariate and all other models. This finding implied that the occupational skill level was not a risk factor of anxiety in Hong Kong.

In terms of working hours, employees who worked for ≥ 72 h per week were significantly associated with anxiety compared with those who worked for ≤ 36 h. This finding was also found in the univariate model and Model 3. The odds ratio of long working hours (≥ 72 h) to short working hours (≤ 36 h) was 5.94 in Model 3. This finding showed that there was a strong independent effect of long working hours on anxiety. It supported the argument that long working hours could lead to anxiety [33, 34] and suggested a possible threshold hours for risk of mental health [35]. This finding was important for regulation of working hours in Hong Kong, especially to low-skilled workers including cleaners, elderly homes workers and security guards who are prone to long working hours (Legislative Council [22]). The long working hours has been a long-time concern for workers and policy makers in Hong Kong and the legislation of standard working hours is under continuous debate. This study provides additional evidence to the policy debate about the negative independent effect of long working hours on mental health of workers. On the other hand, greater length of stay at current job was found as a protective factor from anxiety. This additional finding showed that the perceived stability at work protected workers from anxiety after controlling for income and other employment factors. This additional finding was crucial to labor policy design that the precarious employment induced by short-term contract-based arrangement may further worsen the mental health of workers. In other words, besides regulation of working hour, stable employment arrange can also protect workers from risk of mental problems.

This article provides four policy implications and suggestions. Firstly, the government should consider introducing statutory standard working hours or regulating the working hours on the basis of collective bargaining that allows unions to negotiate with employers. These policies could protect labour workers from the risk of overwork and unfair pay. Secondly, the government could enhance workers' job stability via the employment legislation protection to prevent inappropriate dismissal of labour given that the tenure of jobs was positively associated with workers' mental health. Thirdly, the level of existing statutory minimum wage should be increased to meet the basic needs of the labour workers' families. In this way, workers could avoid overwork due to wage inadequacy. Moreover, the increase of minimum wage could help low-income workers not to be income poor, which was found significantly associated with anxiety. Finally, the government could promote the employment practices that strengthen work–life balance and mitigate work–family conflicts against long working hours. In this way, greater gender equality could be encouraged at workplaces.

Conclusion

Our results indicate that the independent impact of working hour on anxiety. A working period of 72 h per week was a significant threshold to cause anxiety to workers. On the other hand, addition finding shows that stable job arrangement was a protective factor to workers from anxiety. The long working hours and precarious employment situation do harm on mental health of workers. Implementation of labour market regulations, such as standard working hour policy and stable job arrangement, are crucial to mitigate risk of anxiety for working people in Hong Kong.

Author Contributions Siu Ming Chan was responsible for literature search, data analysis, data interpretation and writing of this paper. Tat Chor Au-Yeung was responsible for literature search and writing of this paper. Hung Wong and Roger Chung were responsible for the overall research design, data collection of the data set. Gary Chung was responsible for data interpretation and writing of this paper. All authors read and approved the final manuscript.

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Declarations

Ethical Approval This study was approved by the Survey and Behavioral Research Ethics Committee of The Chinese University of Hong Kong in Jun 2012.

Conflict of Interest No potential conflict of interest was founded.

References

1. Filia KM, Cotton SM, Watson AE, Jayasinghe A, Kerr M, Fitzgerald PB. Understanding the barriers and facilitators to employment for people with bipolar disorder. *Psychiatr Q.* 2021;1–15. <https://doi.org/10.1007/s1126-021-09931-w>.

2. Na EY, Lim YJ. Influence of Employment on the Positive Mental Health of Individuals with Schizophrenia Living in the Community. *Psychiatr Q*. 2020;91(1):203–8. <https://doi.org/10.1007/s11266-019-09686-5>.
3. Perreault M, Power N, Touré EH, Caron J. Transitional Employment and Psychological Distress: a Longitudinal Study. *Psychiatr Q*. 2020;91(3):735–47. <https://doi.org/10.1007/s11266-020-09739-0>.
4. Stevenson BJ, Mueller L, Kelly MM, Rosenheck RA. Correlates of obtaining employment among veterans receiving treatment for severe PTSD in specialized intensive programs. *Psychiatr Q*. 2021;1–14. <https://doi.org/10.1007/s11266-020-09864-w>.
5. Mercille J. Neoliberalism and health care: the case of the Irish nursing home sector. *Crit Public Health*. 2018;28(5):546–59. <https://doi.org/10.1080/09581596.2017.1371277>.
6. Rubery J, Ward K, Grimshaw D, Beynon H. Working Time, Industrial Relations and the Employment Relationship. *Time Soc*. 2005;14(1):89–111. <https://doi.org/10.1177/0961463X05050300>.
7. Tsai MC, Nitta M, Kim SW, Wang W. Working Overtime in East Asia: Convergence or Divergence? *Journal of Contemporary Asia*. 2016;46(4):700–22. <https://doi.org/10.1080/00472336.2016.1144778>.
8. Goh J, Pfeffer J, Zenios SA, Rajpal S. Workplace stressors & health outcomes: Health policy for the workplace. *Behav Sci Policy*. 2015;1(1):43–52. <https://doi.org/10.1353/bsp.2015.0001>.
9. Otterbach S, Charlwood A, Fok YK, Wooden M. Working-time regulation, long hours working, overemployment and mental health. *Int J Hum Resour Manag*. 2019;1–28. <https://doi.org/10.1080/09585192.2019.1686649>.
10. Virtanen M, Ferrie JE, Singh-Manoux A, Shipley MJ, Stansfeld SA, Marmot MG, Kivimäki, M. Long working hours and symptoms of anxiety and depression: A 5-year follow-up of the Whitehall II study. *Psychol Med*. 2011;41(12):2485–94. <https://doi.org/10.1017/S0033291711000171>.
11. Kim SS, Subramanian SV, Sorensen G, Perry MJ, Christiani DC. Association between change in employment status and new-onset depressive symptoms in South Korea - A gender analysis. *Scand J Work Environ Health*. 2012;38(6):537–45. <https://doi.org/10.5271/sjweh.3286>.
12. Shields M. Long working hours and health. *Health Report*. 1999;11(2):33–48.
13. Driesen K, Jansen NWH, Kant I, Mohren DCL, Van Amelsvoort LGPM. Depressed mood in the working population: Associations with work schedules and working hours. *Chronobiol Int*. 2010;27(5):1062–79. <https://doi.org/10.3109/07420528.2010.489877>.
14. Samuel R, Kanji S. Valuing creativity, feeling overworked and working hours: Male workers and the New Spirit of Capitalism. *Time and Society*. 2020;29(1):51–73. <https://doi.org/10.1177/0961463X18820730>.
15. Kameräde D, Wang S, Burchell B, Balderson SU, Coutts A. A shorter working week for everyone: How much paid work is needed for mental health and well-being? *Soc Sci Med*. 2019;241(112353). <https://doi.org/10.1016/j.socscimed.2019.06.006>
16. Bannai A, Tamakoshi A. The association between long working hours and health: A systematic review of epidemiological evidence. *Scand J Work Environ Health*. 2014;40(1):5–18. <https://doi.org/10.5271/sjweh.3388>.
17. Afonso P, Fonseca M, Pires JF. Impact of working hours on sleep and mental health. *Occup Med*. 2017;67(5):377–82. <https://doi.org/10.1093/occmed/kqx054>.
18. Artazcoz L, Cortès I, Benavides FG, Escribà-Agüir V, Bartoll X, Vargas H, Borrell C. Long working hours and health in Europe: Gender and welfare state differences in a context of economic crisis. *Health Place*. 2016;40:161–8. <https://doi.org/10.1016/j.healthplace.2016.06.004>.
19. Kleppa E, Sanne B, Tell GS. Working overtime is associated with anxiety and depression: The Hordaland health study. *J Occup Environ Med*. 2008;50(6):658–66. <https://doi.org/10.1097/JOM.0b013e3181734330>.
20. Lau YK, Ma JLC, Wan PS, Wong TKY, Lai LY. Work-family conflicts, family leisure activities, and family functioning in Hong Kong. *Internat Employ Relat Rev*. 2012;18(1):82–100.
21. Ko GT, Chan JC, Chan AW, Wong PT, Hui SS, Tong SD, Ng SM, Chow F, Chan CLW. Association between sleeping hours, working hours and obesity in Hong Kong Chinese: The “better health for better Hong Kong” health promotion campaign. *Int J Obes*. 2007;31(2):254–60. <https://doi.org/10.1038/sj.ijo.0803389>.
22. Legislative Council. Statistical Highlights: Working hours in Hong Kong. Hong Kong Special Administrative Region. 2020. Retrieved from <https://www.legco.gov.hk/research-publications/english/1920issh06-working-hours-in-hong-kong-20191108-e.pdf>.
23. Census and Statistics Department. *2019 Report on Annual Earnings and Hours Survey*. Hong Kong Special Administrative Region. 2020. Retrieved from <https://www.statistics.gov.hk/pub/B10500142019AN19B0100.pdf>.
24. Henry JD, Crawford JR. The short-form version of the Depression anxiety stress scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *Br J Clin Psychol*. 2005;44(2):227–39. <https://doi.org/10.1348/014466505X29657>.

25. Moussa MT, Lovibond P, Laube R. Psychometric properties of a Chinese version of the short Depression Anxiety Stress Scales (DASS21). Sydney. 2001.
26. Lovibond SH, Lovibond PF. Manual for the Depression Anxiety Stress Scales. 2nd ed. Sydney: Retrieved from <https://www.psy.unsw.edu.au/dass/>; 1995.
27. Lund C, Breen A, Flisher AJ, Kakuma R, Corrigall J, Joska JA, Swartz L, Patel V. Poverty and common mental disorders in low and middle income countries: A systematic review. *Soc Sci Med*. 2010;71(3):517–28. <https://doi.org/10.1016/j.socscimed.2010.04.027>.
28. Wolff BC, Santiago CD, Wadsworth ME. Poverty and involuntary engagement stress responses: examining the link to anxiety and aggression within low-income families. *Anxiety Stress Coping*. 2009;22(3):309–25. <https://doi.org/10.1080/10615800802430933>.
29. HKSAR government. Hong Kong poverty situation report 2018. Hong Kong poverty situation report. Hong Kong. 2017. Retrieved from [https://www.povertyrelief.gov.hk/eng/pdf/Hong_Kong_Poverty_Situation_Report_2018\(2019.12.13\).pdf](https://www.povertyrelief.gov.hk/eng/pdf/Hong_Kong_Poverty_Situation_Report_2018(2019.12.13).pdf).
30. Honkonen T, Virtanen M, Ahola K, Kivimäki M, Pirkola S, Isometsä E, Aromaa A, Lönnqvist J. Employment status, mental disorders and service use in the working age population. *Scand J Work Environ Health*. 2007;33(1):29–36. <https://doi.org/10.5271/sjweh.1061>.
31. Matilla-Santander N, Martín-Sánchez JC, González-Marrón A, Cartanyà-Hueso À, Lídón-Moyano C, Martínez-Sánchez JM. Precarious employment, unemployment and their association with health-related outcomes in 35 European countries: a cross-sectional study. *Crit Public Health*. 2020. <https://doi.org/10.1080/09581596.2019.1701183>.
32. Milner A, Smith P, LaMontagne AD. Working hours and mental health in Australia: Evidence from an Australian population-based cohort, 2001–2012. *Occup Environ Med*. 2015;72(8):573–9. <https://doi.org/10.1136/oemed-2014-102791>.
33. Ahn S. Working hours and depressive symptoms over 7 years: evidence from a Korean panel study. *Int Arch Occup Environ Health*. 2018;91(3):273–83. <https://doi.org/10.1007/s00420-017-1278-z>.
34. Marin-Garcia JA, Bonavia T, Losilla J-M. Changes in the Association between European Workers' Employment Conditions and Employee Well-Being in 2005, 2010 and 2015. *Int J Environ Res Public Health*. 2020;17(3):1048. <https://doi.org/10.3390/ijerph17031048>.
35. Ganster DC, Rosen CC, Fisher GG. Long Working Hours and Well-being: What We Know, What We Do Not Know, and What We Need to Know. *J Bus Psychol*. 2018;33(1):25–39. <https://doi.org/10.1007/s10869-016-9478-1>.

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