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# Overtime Worked and Its Effect on Burnout, Illness, and Health outcomes

Haoqiu Zhang

# OVERTIME WORKED AND ITS EFFECT ON BURNOUT, ILLNESS, AND HEALTH OUTCOMES

A Thesis

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

in

Industrial Organizational Psychology

by

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ABSTRACT

Professional employees at work deal with stressors such as extensive workload and coursework, prolonged work and class schedules, overtime, and performance concerns from their supervisors and managers. The length of time working, the pressure one has in one's work life, and the amount of overtime can be a predictor of burnout (Brown & Pranger, 1992), and employees being burnt out can result in numerous issues in people’s health. Working overtime, as a stressor, is very common in the workplace and has continuously increased among employees (Hetrick, 2000). The primary purpose of this study was to explore the effect of overtime hours worked with burnout, illness, and potential health outcome. After a convenience sampling survey, we gathered 261 valid responses and found that overtime hours worked was significantly associated with illness and health outcomes. Participants who worked more overtime resulted in more illness and more negative health outcomes.

## ACKNOWLEDGEMENTS

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# CHAPTER ONE

## Introduction

As shown by the International Labor Office, average working hours in the United States ranked fourth internationally wise. The International Labor Office (2004) stated different advantages and disadvantages for employers and employees in terms of overtime. The advantages for the employees can be increased total earnings, while the advantages for the employers can be higher productivity, extended operation hours, and better matching of workload to fluctuations in market demands. However, disadvantages for employers can be an extra costs and reduced productivity during overtime hours. The disadvantages for the employees typically include difficulties in balancing work and life and longer working hours, which potentially result in negative health and safety impacts due to fatigue, stress, and increased accidents (International Labor Office, 2004).

In this paper I aimed to examine the effect that working overtime has on employee burnout, illness caused, and potential health outcomes. This topic is essential to our lives because as a fourth leading country globally in terms of overtime worked, it is essential to understand its effects so that employers can minimize the potentially negative consequences of overtime. Overtime refers to the extra working hours beyond the employee's regular working hours. The definitions and the laws about overtime vary from place to place based on local governmental regulations. Overtime was widely defined as work hours beyond

eight hours per day, and it can be a predictor of employee burnout and other consequences such as health and safety issues (International Labor Office, 2004).

Total overtime worked by employees also varies among different areas and cultures of the area, for example, according to Akerstedt et al. (2004), only nine percent of European Union employees work more than forty-eight hours per week, while in the United States, average working hours are higher. Overtime is also related to pay, where Hewlett and Luce stated that if overtime is positively related to one's pay. More overtime will result in less time for sleeping (Liu & Tanaka, 2002). Overtime interferes with sleep and recovery, and it contributes to sleep disturbance. Sigurdson and Ayas's (2007) study shows sleep disorder is related to several adverse physiologic and long-term negative health outcomes, including but not limited to mortality, diabetes, and cardiovascular disease. Another study by Swanson et al. (2012) found that sleep disorders can negatively predict work outcomes, including absenteeism and occupational accidents. Given that the total hours of overtime have been identified as having an impact on sleep, including sleep schedule as well as sleep disorders. Controlling the amount of overtime worked can positively impact a sleep schedule and decrease the risk of sleep disorders, positively affecting health and work outcomes. Therefore a primary purpose of the present study was to examine the effects of working overtime has on burnout, illness, and health outcomes.

# CHAPTER TWO

# LITERATURE REVIEW

## Overtime And Work Schedule

Overtime is closely related to work shifts where different areas have different rules and regulations. Work schedules can be different based on many factors. Knauth (1998) stated that there are more than 10,000 different work schedules used worldwide, including the differences in the time of work, such as whether employees work during day time, evening time, or night time; whether they are fixed or rotating shifts, the numbers of hours worked per day, the amount of overtime required per day, the number of rest days, number of days off, number of consecutive workdays before rest will all influence one's work schedule (Knauth, 1998). Different work schedule arrangements affect people differently, and it varies systematically as a function of region or culture.

Overtime worked, long working hours, and extended schedules are closely related to employee burnout (Luther et al., 2017), leading to negative consequences including lower productivity, lower quality of job, and lower health outcome. In Japan, a study by Bannai and Tamakoshi (2014) found long working hours had significant adverse effects on most health outcomes such as mortality, circulatory disease, depression, and anxiety. Another study by Johnson and Lipscomb (2006) indicates that long working hours, extended, and irregular working schedules are associated with acute reactions including stress and fatigue, as well as adverse health behavior such as smoking and drinking.

A study by Artazcoz et al. (2009) investigated the effect of gender differences on long working hours and extended schedules. Researchers found that factors that are associated with long working hours (i.e., working 51-60 hours per week) differed by gender. Specifically, men, under long working hours, reported having poor mental health status, hypertension, smoking, job dissatisfaction, and no leisure time physical activity. In female participants, however, long working hours and extended schedules were only related to smoking and shortage of sleep. Moreover, a meta-analysis by Wong et al. (2019) analyzed 243 records from 46 papers to examine the effect of long working hours on workers' occupational health. Results indicated that long working hours and extended schedules are closely related to occupational health problems such as short sleep duration, fatigue, injuries, and poor health conditions. Besides the various negative effects of long working hours on health, workers who work long working hours and extended schedules also report different stages of burnout (Lin et al., 2021), which can also have a negative impact on employees and employers.

## Burnout

Recently, the term burnout became more popular in organizations to describe job stress and job tiredness. Maslach and Leiter (2006) wrote about how burnout was like a flame being reduced to ashes, which was an analogy with a person's own experience of psychological erosion over time in their book titled, Stress and Quality of Working Life. As the flame of motivation, commitment, and

dedication has burned out, as stated by Maslach and Leiter, the ashes being left over in jobs would become exhaustion, cynicism, and ineffectiveness. The authors defined job burnout as a psychological syndrome that is related to interpersonal stressors on the job. They explained the three critical dimensions of the response to burnout were being overwhelmed, being detached from their job, and starting to accomplish less. The exhaustion dimension referred to being overwhelmed and lacking the energy to face new problems and challenges. The cynicism dimension referred to a negative or excessively detached response to one's job where people begin to lag off, cut down and reduce what they are doing at their work. When cynicism happens, people start to perform the bare minimum to get the job done instead of committing to their best efforts. The inefficacy dimension represented burnout's self-evaluation, which is the feeling of lack of productivity and achievement at work. People with this dimension of burnout might be self-questioning about their existence in their jobs and decline in their accomplishments.

Overall, burnout can negatively affect work performance, particularly self-esteem-related performance (Garden, 1991). Organizations try to decrease and eliminate burnout because burnout can be contagious. Bakker, Le Blanc, and Schaufeli (2005) found out burned-out employees may negatively influence colleagues, and burned-out managers may influence their departments and burn their entire departments out as well (Pines, 2011). Burnout also has other consequences, such as illness and negative health outcomes. Being burned out

has negatively impacted employee health (Melamed et al., 2006) and is related to depression (Toker &Biron, 2012).

Peterson et al. (2019) investigated the relationship between different work schedules and burnout. The result indicates long work shifts and mandatory overtime work are associated with the overall burnout in employees. Night shift employees tend to have a higher association with depersonalization compared to employees who do not work during night hours. This study also found that irregular schedules were associated with emotional exhaustion and depersonalization. A study by Luther et al. (2017) indicated that overtime worked is associated with negative work outcomes, positive work stress, and positive work burnout. The authors also indicated that employees who work overtime have less confidence in their work abilities, which negatively impacts their work performance. Similarly, a study by Cañadas-De et al. (2016) found 44.1% of employees who perform overtime have high burnout scores compared to 38% of those who do not perform overtime daily. They also found an association between overtime worked and burnout dimensions, such as emotional exhaustion and depersonalization. Another study by Jiang et al. (2022) found burnout mediates the relationship between working overtime and turnover intention, indicating a relationship between overtime worked and burnout. The research above all indicates that overtime worked will have a negative relationship with burnout, thus the following was predicted:

H1: Overtime worked will positively predict burnout. The higher levels of overtime worked will relate to higher levels of burnout.

Illness

Overtime is related to different illnesses. In the United States, Ettner and Grzywacz (2001) investigated the relationship between overtime and the likelihood of reporting negative work effects on health. Participants working more than 45 hours per week reported to have a 25% increase in the likelihood of reporting the negative effect of work on both physical and mental health. In the United Kingdom, Worrall and Cooper (1999) investigated the relationship between overtime and perception of health. Their results indicated that long working hours and overtime adversely affected the managers' health, with 75% of the managers who worked over 60 hours per week reporting being less healthy and only 21% of the managers who worked less than 35 hours per week reporting themselves as being less healthy.

Lipscomb et al. in 2002 investigated the relationship between extended working hours and back, shoulder, and neck disorders one is experiencing. Results showed nurses who work on a shift that is more than 12 hours per day have a higher risk of developing back disorders. The result also showed that nurses who work a shift that is more than 12 hours per day, combined with nurses who work more than 40 hours per week, are associated with a higher risk of neck, shoulder, and back disorders.

A study in the Netherlands by Van der Hulst and Geurts (2001)

investigated full-time postal workers and managers with a questionnaire asking them about overtime. They found that over time the low reward is associated with low recovery, burnout, negative work-home interference, and health complaints. The study also found that low reward with no overtime showed similar risks as overtime with low reward. More importantly, the researchers found that low rewards and high pressure to work overtime can be associated with adverse health complaints, poor recovery, burnout, and negative work-home interference. Thus, overtime can result in negative consequences, but having a low reward for one's job can create an interaction within the relationship between overtime and negative effects.

In Sweden, Fredriksson et al. (1999) examined the relationship between overtime and neck and shoulder disorders. Overtime hours worked were associated with women's neck and shoulder disorders, and the combination of overtime and the additional domestic workload was also associated with women's and men's neck disorders. In addition, Voss et al. (2001) found that over 50 hours of overtime per year is associated with a lower incidence of sickness absences, but other factors, such as complaints of heavy lifting and bullying, can still be a predictor for the high incidence of sickness absences per year. In addition, Nylen et al. (2001) found that women with more than five hours of overtime worked per week are positively associated with mortality at the 24 years of mortality follow-up. Men with less than five hours of overtime worked per week are negatively associated with mortality at the 24 years of mortality follow-

up; men with more than five hours of overtime worked per week and having extra working hours outside of regular employment hours are positively associated with mortality at the 24 years of mortality follow-up. Bergquvist et al. (1995) found that overtime and extensive overtime are positively correlated with discomfort in the arm and hand areas. In China, Donald and Siu (2001) found overtime is positively related to the number of health complaints one will have. Still, overtime payment is negatively associated with the number of health complaints one will have, only in men.

A study by Nakanishi et al. (2003) found the risk of developing impaired fasting glucose and type 2 diabetes mellitus decreases with an increased work hour per day. Through questionnaires, Kawakami et al. (1999) found that overtime is positively associated with the risk of diabetes or cardiovascular disease. Furthermore, there would be more risks if participants worked 50 hours of overtime per month compared to if participants worked less than 25 hours per month. Another study by Nakano et al. (1998) examined the relationship between working very long shifts and health outcomes. In their study, Group A was allowed to work overtime after their 2 am shift, while Group B was not allowed to work overtime. The result showed that Group B, who were not allowed to work overtime, had increased Th2-type cytokines, which in turn improves the body's immune response and ability to deal with stressful situations. Their responses were portrayed as more depressed lymphocyte proliferation than Group A, who were allowed to work overtime. Given the literature reviewed above, the following

was predicted:

H2: Overtime worked will positively predict physical illness. The higher levels of overtime worked will relate to higher levels of illness.

Health Behaviors

Overtime can be related to various health behavior outcomes. In the United States, Trinkoff and Storr (1998) found that overtime and night shifts are not significantly associated with drug use, but the risk for smoking will increase if nurses work a night shift that is more than 8 hours per shift. The risk of alcohol use increases if nurses work more than 8 hours per day compared to nurses who work less than 8 hours per day. The risk of alcohol use increases if nurses are working 1 to 7 days of overtime per month and working for more than 8 hours on the night shift and more than 8 hours rotating shifts. Rosa et al. (1998) examined the relationship between extensive work schedules and fatigue and found that fatigue can be the highest during a twelve-hour night shift and can rise more quickly if participants work night shifts than day shifts.

In Japan, Mizoue et al. (2001) investigated 1,281 employees with a questionnaire looking at whether the participants had overtime in their previous month (0-10 hours of overtime worked, 10-30 hours of overtime worked, or more than 30 hours of overtime worked). The result showed that overtime is negatively associated with being active in sports, overtime is positively related to environmental tobacco smoke, and overtime is positively related to the risk of developing sick-building syndrome symptoms. Therefore, the more overtime one

engages in, the less chance one will participate in healthy behaviors such as exercise, but the more chance one will be able to participate in unhealthy behaviors such as smoking. A study by Nakamura et al. (1998) examined the relationship between overtime and body mass index and found that as overtime increases, BMI increases, as well as waist circumference. When controlling for the confounding variable of late dinner, researchers still found a significant positive association between overtime and an increase in BMI, and when controlling for age, there is still a significant positive association between overtime hours and increases in waist circumference.

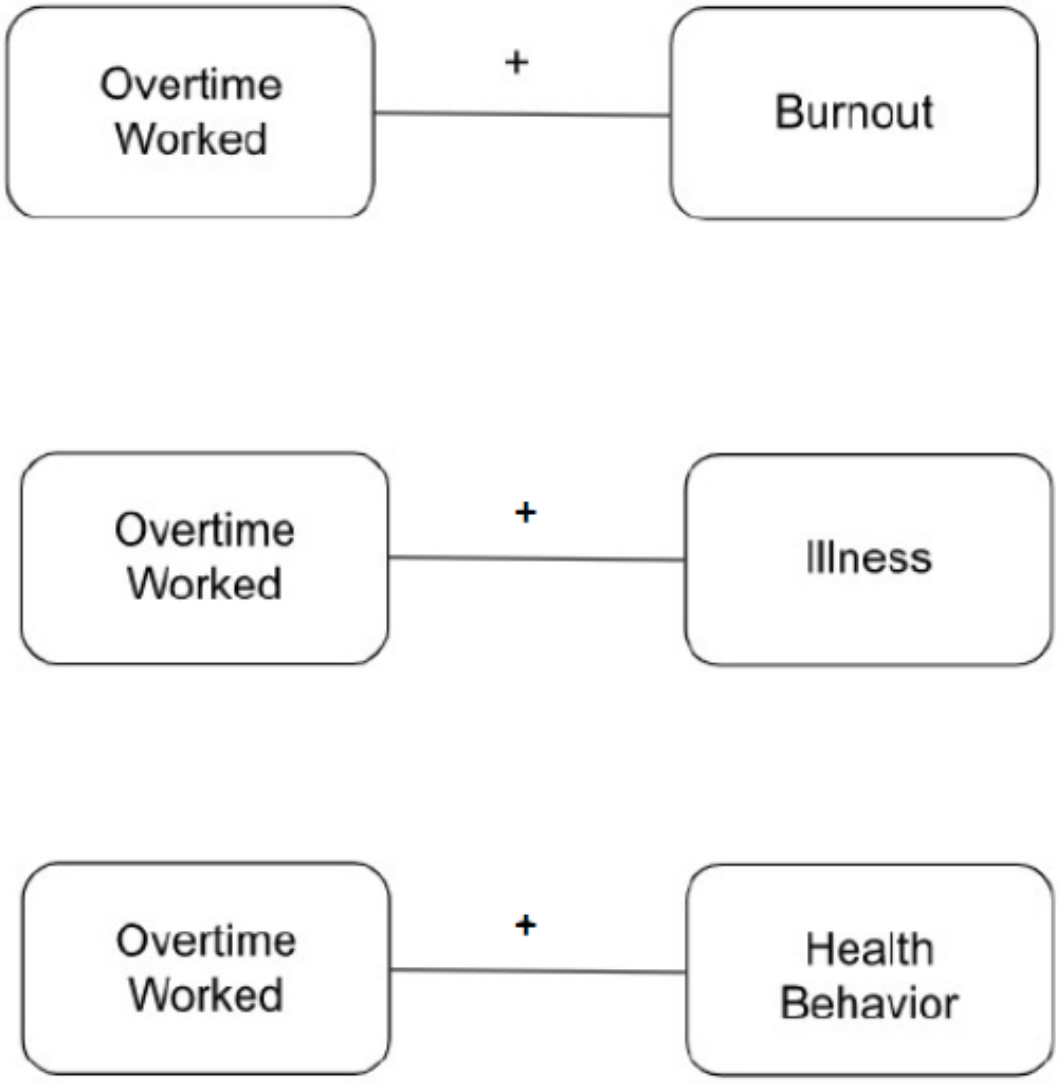
In Australia, Mitchell and Williamson (2000) examined the relationship between extended work shifts combined with more than 40 hours of working hours per week and health behavior outcomes and found that more health complaints were reported during the eight-hour shift rotation than the twelve-hour shift rotation. However, smoking and alcohol consumption decreased when the shift changed from 8 hours to 12 hours shift. In addition, workers made more mistakes on vigilance tests when they were on 12 hours shifts compared to when they were on 8 hours shifts. In Canada, researcher Shields (2000) found that women who have increased working hours and reduced their working hours from long to standard hours have a higher risk of alcohol consumption, but this finding was not significant in men. Men who have their work hours decreased will have an increased chance of alcohol consumption. Results indicated that men who increased their working hours from standard hours to long hours showed an

increase in weight gain compared to men who are working standard hours, and men who work long hours will have an increased risk of excessive weight gain. Results also indicated that men who increased their work hours from standard hours to long hours have an increased risk of smoking, which is also significant in women. The result did not show an important result in changes in exercise and work hours. Given the literature reviewed above, the following was predicted:

H3: Overtime worked will positively predict negative health outcomes such as drinking and smoking. The higher levels of overtime worked will relate to higher levels of negative health outcomes.

CHAPTER THREE

HYPOTHESIS



# CHAPTER FOUR

# METHOD

## Participants

After random sampling for an online self-reported survey via Qualtrics, 342 participants were gathered over two weeks, from March 1st of 2023 to March 15th of 2023. After data cleaning, 81 responses were deleted due to failure to answer both attention check questions correctly, we end up having 261 participants remaining.

Of the 261 participants, the average age is 50.1 years old, with a standard deviation of 24.64. The average number of children participants have is 2.99 children, with a standard deviation of 1.53. On average, participants work 40.73 hours of overtime on a weekly basis, with a standard deviation of 34.03 hours. 39.8 percent of the participants identified themselves as male (N = 104), 44.8 percent of the participants identified themselves as Female (N = 117), 12.6 percent of the participants identified themselves as non-binary (N = 33), and the rest of the 2 percents of the participants were self-identified and preferred not to answer (N = 5).

11.1 percent of the participants are black or African American (N = 29), 13.8 percent of the participants are American Indian or Alaska Natives, 62.1 percent of the participants are Asian (N = 162), 4.2 percent of the participants are Native Hawaiian or Pacific Islander (N = 11), 6.1 percent of the participants are

White (N = 16), and the rest of the 2 percents of the participants were self-identified and preferred not to answer (N = 5).

Out of the 261 responses, 30.3 percent of the participants worked part-time (N = 79), and 67.8 percent of the participants worked full-time (N = 177). 85.1 percent of the participants worked in extended work shifts (working 10 or 12 hour shifts instead of a 8 hour shift, N = 222), and 14.9 percent of the participants did not work in extended work shifts (N = 39). The willingness of working overtime differed among participants, more participants are not willing to work overtime (N = 168), compared to participants who are willing to work overtime (N = 57).

**Table 1**

*Descriptive Statistics and Correlations for Study Variables*

| Variable | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1. Gender [a] | 104 | 117 | 33 | 3 | 2 | - | - |
| 2. Ethnicity [b] | 29 | 36 | 162 | 11 | 2 | 3 | 16 |
| 3. Children [c] | 52 | 83 | 34 | 29 | 52 | 10 | - |
| 4. Part-time or Full-Time [d] | 79 | 177 | - | - | - | - | - |
| 5. Extended Work Shifts [e] | 222 | 39 | - | - | - | - | - |
| 6. Willingness [f] | 122 | 46 | 36 | 41 | 16 | - | - |

[a] 0 = Male, 1 = Female, 2 = Non-Binary, 3 = I prefer to self-identify, 4 = Prefer Not to Answer.

[b] 0 = Black or African American, 1 = American Indian or Alaska Native, 2 = Asian, 3 = Native Hawaiian or [c] Pacific Islander, 4 = I prefer to self-identify, 5 = Prefer Not to Answer, 6 = White.

[c] 0 = No Children, 1 = One Child, 2 = Two Children, 3 = Three Children, 4 = Four Children, 5 = Five or More Children.

[d] 0 = Part-time Employee (Working Less Than 35 Hours Per Week), 1 = Full-Time Employee (Working More Than 35 Hours Per Week).

[e] 0 = Working Extended Shifts, 1 = Not Working Extended Shifts.

[f] 0 = Disagree, 1 = Somewhat Disagree, 2 = Neither Disagree or Agree, 3 = Somewhat Agree, 4 = Agree, 5 = Agree.

## Procedure

The study utilized a non-probability sampling method through a convenience sample. Participants must obtain at least one job to participate in this survey to examine the relationship between the hours of overtime worked, employee burnout, and potential health outcomes. The survey was distributed through Qualtrics. Basic demographic information such as how many children a participant has, ethnicity, work industry, job title, hours of work, and job(s) currently working for were included in the survey.

The survey was about fifteen to twenty minutes long and contained a consent form describing the purpose, duration, risks, and benefits of the survey. The

consent form also includes phrases indicating that participation is entirely voluntary, and participants can skip any questions if they would like to. Information regarding data confidentiality, data storage, results analysis, and the researcher's contact information was also included in the consent form. The survey was distributed online, specifically targeting people who are currently employed. There was no restriction in terms of the length of hours worked. The survey contains basic overtime and work schedule questions, and attention check-ups.

Due to the length of the survey, survey questions were all developed in a matrix-like structure to show all questions for each measure on one page. The survey was concluded with a brief thank-you note from the researcher. The survey was distributed through various local social media platforms, Instagram, Reddit, and Facebook. Most surveys are distributed through the Chinese social media WeChat for data collection over the course of one week. We ended up with 343 responses, and after data cleaning, we have 261 responses remaining.

Data Cleaning

To ensure quality responses, participants were removed if they completed less than 80% of the entire survey. Participants were removed if they responded with 0 hours worked per week. There were three attention check questions, the third attention question asks whether the participant responded honestly to this survey and can use their data in my study. If participants responded "No" to this question, their response was removed as well. For the two remaining questions,

participants who answered both questions wrong will be removed. Their data was used if they only answered one of the questions incorrectly.

Maslach Burnout Inventory-Emotional Exhaustion

The Maslach Burnout Inventory measures access different dimensions of Burnout Syndrome (emotional exhaustion, depersonalization, and personal efficacy) (Maslach et al., 1997). For this study, only the emotional exhaustion dimension was used which contains a total of six items. The Maslach Burnout Inventory uses a 7-point Likert scale, with 0, which means almost never, to 6, which means every day. A sample question is “Working with people all day long requires a great deal of effort”, and the responses range from 0, Never; 1, A few times per year; 2, once a month; 3, a few times per month; 4, once a week; 5, a few times per week; and 6, every day.

The emotional exhaustion dimension of the MBI was found to have a good internal consistency with a Cronbach’s alpha of .844 (Lin et al., 2022). From the current study, we still found a good internal consistency with a Cronbach’s alpha of .72.

Physical Symptoms Inventory

The Physical Symptoms Inventory measure assesses participants’ current health situation. Questions include the physical discomfort the participants might be currently experiencing such as backache and headache. The Physical Symptoms Inventory is 13-items, which uses a 5-point Likert scale, with 1, which means not at all to 5, which means every day. One sample question from the

physical symptoms inventory is “Acid indigestion or heartburn”, and the responses range from not at all; once or twice; once or twice per week; most days; and every day.

The Physical Symptoms Inventory was found to have a good internal consistency with a Cronbach’s alpha of .85 (Spector & Jex, 1998). In the survey, at the end of this inventory, a four-item self-designed Health Outcome Inventory is also included. We found a good internal consistency with a Cronbach’s alpha of .73 for the Physical Symptoms Inventory, which we now call the illness measure.

Health Outcome Inventory

The Health Outcome Inventory measure assesses participants’ health outcomes. Questions include participants’ health activities they currently experience and the frequency of those health outcomes such as whether they are currently smoking and drinking. The Health Outcome Inventory is a self-designed four-item inventory investigating participants’ health outcomes that includes smoking, exercising, drinking, and using drugs or other substances. And the responses range from 0, Never; 1, A few times per year; 2, once a month; 3, a few times per month; 4, once a week; 5, a few times per week; and 6, every day.

The Health Outcome Inventory’s internal consistency will be measured with SPSS-28. The EFA approach was used, and we found a good internal consistency with a Cronbach’s alpha of .79.

# CHAPTER FIVE

## Results

All relationships were evaluated by conducting a zero-order correlation, regression, and reliability analysis through SPSS. SPSS was used when considering the number of children factor into the regression analysis. From zero-order correlation, we conclude that the number of children is significantly related to the hours of overtime worked ($r = .76$, $p < .001$). We suspect that the more children one has, the harder one will need to work to support their children, thus results to more overtime (see table 1)

**Table 2.**

*Mean, Standard Deviation, and Pearson Zero-Order Correlations Between Overtime worked, and variables*

| | *M* | *SD* | *1* | *2* | *3* | *4* | *5* |
|---|---|---|---|---|---|---|---|
| 1. Overtime worked | 40.827 | 33.928 | | | | | |
| 2. Number of Children | 2.91 | 1.542 | .761** | | | | |
| 3. Average Burnout | 5.326 | 1.045 | .036 | .159* | | | |
| 4. Average Illness | 3.403 | .943 | .151* | .436** | .473** | | |
| 5. Average Health Behavior | 3.457 | .857 | .125* | .421** | .42** | .839** | |

Note: * $p < 0.5$, ** $p < .01$; M is Mean, SD is Standard Deviation.

H1: Overtime worked will positively predict burnout. The higher levels of overtime worked will relate to higher levels of burnout.

Based on the correlation results from SPSS, this hypothesis was not supported (r = .137, p = .572), more overtime worked is not related to burnout. In a regression analysis with number of children entered as a control variable, overtime did not predict burnout, this hypothesis was not supported [b = -.005, SE = .003, β = -.162, r^2 = .030, p = .096].

**Table 3.**

*Coefficients*

| Model | | *b* | *SE* | *β* | *t* | *Sig.* |
|---|---|---|---|---|---|---|
| 1 | (Constant) | 5.112 | .134 | | 38.054 | <.001 |
| | Number of Children | .087 | .040 | .137 | 2.164 | .031 |
| 2 | (Constant) | 5.066 | .137 | | 37.079 | <.001 |
| | Number of Children | .165 | .062 | .260 | 2.68 | .008 |
| | Overtime | -.005 | .003 | -.162 | -1.671 | .096 |

1. *Dependent variable: AVGBurnout*

**Table 4.**

*Model Summary for Average Burnout scale*

| Model | *R* | *R Square* | *Std Error of the Estimate* | *R Square Change* | *F Change* | *Sig F Change* |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 Regression | .137 | .019 | .960 | .019 | 4.684 | .031 |
| 2 Regression | .172 | .030 | .956 | .011 | 2.794 | .096 |

*Predictors: (Constant), How many children do you have?*

*Predictors: (Constant), How many children do you have? On average, how many hours of overtime do you work weekly? (Work hours that exceeds 40 hours per week are considered as overtime) – Hours*

H2: Overtime worked will positively predict illness. The higher levels of overtime worked will relate to higher levels of illness.

Based on the correlation results, this hypothesis was supported (r = .15, p = 0.01). More overtime worked was positively related to higher level of illness. In a regression analysis with number of children entered as a control variable, overtime did not predict burnout, this hypothesis was supported [b = -.01, SE = .001, β = -.356, r^2 = .199, p<.001].

**Table 5.**

*Coefficients*

| Model | | *b* | *SE* | *β* | *t* | *Sig.* |
|---|---|---|---|---|---|---|
| 1 | (Constant) | 2.767 | .117 | | 23.752 | <.001 |
| | Number of Children | .235 | .035 | .395 | 6.756 | <.001 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | (Constant) | 2.675 | .115 | | 23.197 | <.001 |
| | Number of Children | .396 | .052 | .666 | 7.617 | <.001 |
| | Overtime | -.010 | .001 | -.356 | -4.073 | <.001 |

1. *Dependent variable: AVGIllness*

**Table 6.**

*Model Summary for Average Illness scale*

| Model | *R* | *R Square* | *Std Error of the Estimate* | *R Square Change* | *F Change* | *Sig F Change* |
|---|---|---|---|---|---|---|
| 1 Regression | .372 | .139 | .749 | .139 | 39.407 | <.001 |
| 2 Regression | .446 | .199 | .724 | .061 | 18.495 | <.001 |

*Predictors: (Constant), How many children do you have?*

*Predictors: (Constant), How many children do you have? On average, how many hours of overtime do you work weekly? (Work hours that exceeds 40 hours per week are considered as overtime) – Hours*

H3: Overtime worked will positively predict negative health outcomes. The higher levels of overtime worked will relate to higher levels of negative health outcomes.

Based on the correlation results, this hypothesis was supported (r = .12, p = 0.05). More overtime worked was positively related to higher levels of negative health outcomes. In a regression analysis with number of children entered as a

control variable, this hypothesis was supported [b = -.009, SE = .002, β = -.381, r^2 = .446, p<.001].

**Table 7.**

*Coefficients*

| Model | | *b* | *SE* | *β* | *t* | *Sig.* |
|---|---|---|---|---|---|---|
| 1 | (Constant) | 2.940 | .105 | | 27.973 | <.001 |
| | Number of Children | .196 | .031 | .372 | 6.277 | <.001 |
| 2 | (Constant) | 2.849 | .104 | | 27.468 | <.001 |
| | Number of Children | .396 | .047 | .663 | 7.482 | <.001 |
| | Overtime | -.009 | .002 | -.381 | -4.301 | <.001 |

1. *Dependent variable: AVGHealthBehavior*

**Table 8.**

*Model Summary for Average Health Behavior scale*

| Model | *R* | *R Square* | *Std Error of the Estimate* | *R Square Change* | *F Change* | *Sig F Change* |
|---|---|---|---|---|---|---|
| 1 Regression | .372 | .139 | .749 | .139 | 39.407 | <.001 |
| 2 Regression | .446 | .199 | .724 | .061 | 18.495 | <.001 |

*Predictors: (Constant), How many children do you have?*

*Predictors: (Constant), How many children do you have? On average, how many hours of overtime do you work weekly? (Work hours that exceeds 40 hours per week are considered as overtime) – Hours*

Scatter plots were generated for overtime worked and each of the outcomes and shows there are no non-linear relationship. Scatter plots can be found in Appendix B. More information regarding gender and its effect on the variable outcomes is attached in Appendix B.

# CHAPTER SIX

## Discussion

As organizations develop, more employees are asked, forced, or voluntarily engage in overtime, having extended work schedules and rotating shifts. As overtime becomes more common in our lives, it is essential to realize the potential illness, health behavior, performance outcomes, injury, and accident consequences of working overtime. Employees who worked overtime might burn themselves out and face a higher risk of encountering different diseases. Working overtime will affect employees' health behavior and might cause employees to use more drugs, consume more alcohol, and smoke more cigarettes.

In this study, our goal was to examine the relationship between overtime worked and burnout, illness, health outcomes. We hypothesized that overtime worked will influence all three measurements, the more overtime worked, the higher chance one will burnout, get ill and develop negative health outcomes. While the relationship between overtime and illness as well as health behaviors are supported, overtime does not necessarily predict burnout based on the results.

In terms of Hypothesis 2 and Hypothesis 3, results from this study are consistent with previous results. Famous studies such as Van der Hulst and Geurts (2001), Fredriksson et al. (1999), Voss et al. (2001), Nylen et al. (2001) all found a significant relationship between overtime worked and illness as well as

health behavior. The significant findings matter to us because, as cited in the introduction, more and more organizations start to focus on the results employees make instead of employees themselves. As more and more organizations require employees to work overtime to finish their job, it will actually negatively affect employees' health, which might lead to opposite results such as decreased work productivity and absenteeism.

In this study, we failed to find a significant relationship between overtime worked and burnout. However, lots of previous researchers in the western countries have demonstrated significance regarding the relationship of the two variables. Studies like Luther et al. (2017), Artazcoz et al. (2009), and Wong et al. (2019) all supported the relationship between overtime worked and burnout. Overtime worked and burnout should be significantly related because as people devotes more time and energy to their work, their opportunity cost for self-care and other positive things they can do for themselves decreases, which will lead to burnout. Most of the previous researchers have a western background. Based on the demographic information of ethnicity, most of our participants are Asian, who might culturally ignore and devalue burnout as a psychological factor. After talking with a few of the participants who selected Asian as their ethnicity, they all mentioned that due to cultural differences, the concept of burnout was rarely used. Most of the literature reviewed above in the literature review section were from a more western background, which explained how the concept of burnout is not popular in the Asian culture. Participants also mentioned that due to the high

supply of labor, compared to a relatively lower demand of job needs, it is very hard for people to think about burnout since they must stay on top of their job, or they might be replaced. Working excessive amount of overtime is also often required and is common among Asian community. When burnout becomes a norm, people tend to think about burnout less, which may lead to a nonsignificant relationship between overtime worked and burnout.

In our study, and consistent with previous research, overtime relates to illness and pain in different areas. People who work more overtime might not move their body and adjust to a better body pose to work, which might lead to bad positioning when standing and sitting and may accelerate the chance of one getting ill. Overtime does predict health behavior since people's time is mostly limited. If one does more overtime, due to the lack of time, the likelihood of him/her engaging in healthy behaviors such as exercising is slim.

We also found that the number of children one has is highly correlated with overtime worked, burnout, illness and health behavior. Although overtime worked is not a predictor of burnout in this study, overtime worked, and number of children together are predictors of burnout. People with higher numbers of children might have heavier family and financial liability as they will need to take care of their children after their work hours. As the number of children increases, people might have less time for themselves since they will need to focus all their energies on their children and work, which might be the reason why it is

correlated with burnout, illness, and health behaviors.

# CHAPTER SEVEN

## Implications

Burnout, illness, and health outcomes can all influence work performance and work presenteeism. As working overtime is closely related to our lives, and the present findings appear to confirm that overtime worked is not significantly correlated with burnout, but is significantly correlated with illness, and negative health outcomes, employers and employees should take this finding into consideration and pick what they want to achieve. Consistent with previous research (Luther et al., 2017), employers will want to manage burnout for higher productivity, higher quality of job, and higher health outcomes. They should manage employees' overtime worked and make sure that their overtime is not extended where they start to burnout from their work, becoming ill, and starting to have negative health outcomes. Previous research (Tamakoshi, 2014) also mentioned that employers can choose to restrict overtime and force their employees to clock out when they finish their shifts since longer working hours can lead to significant adverse effects on most health outcomes. For employees with mandatory overtime worked, employers should do a monthly examination to track their employee's burnout and health status and adjust their workload accordingly. To prevent burnout, as consistent with previous research (Lin et al., 2021), employers should limit working hours and extended schedules to prevent different stages of burnout. Employers should also provide their employees wellness training, making sure they are provided with enough information

regarding their overtime worked so employees will be more aware of how overtime will hurt them and then stop participating in overtime behaviors.

# CHAPTER EIGHT

## Limitations and Future Study Recommendations

Different cultures' view overtime worked differently. The large heterogeneity between the variables of overtime worked, illness, burnout, and health outcomes, can be attributed to individual differences such as socioeconomic status, industry, and job role. In addition, there are other limitations that future researchers can investigate. The limitation of this project is time. This project was completed within 6 months period, which limited the scope of research that could be completed. Because of the time limitation, I was not able to take most of the demographic factors into consideration and failed to thoroughly investigate the differences between each demographic.

The data was collected in the form of a survey, which provides a large set of data at one point of time but failed to present us with any individual changes. For example, we only know that certain participants are working certain number of hours, which causes certain amount of burnout, illness, and health outcomes at this very moment, but the information regarding how changing overtime worked will effect on burnout, illness, and health outcomes remained unknown. Additionally, this study was only able to examine data from 300 participants, a relatively small sample size, with more time to collect data, a larger sample size can be achieved, which may lead to more significant findings, such as differences between subgroups of gender, race, age, work industry, or even taking family liability into consideration. With more time and more resources, data

could be collected using different methods such as interviews or observations, to allow for higher quality and more accurate findings.

Future studies should dig deeper into demographic differences and see the effect of overtime worked on different constructs. For example, the literature reviewed above is from different nations and cultures, and each nation and culture have their own differences. As the findings in various countries and cultures sometimes contradict each other, it is essential for future researchers to investigate the effect of overtime on a multinational basis. Future literatures can also investigate the relationship between overtime and potential illness, health behavior, performance injury, and accident in a group of professionals who are working from home since all participants in the literature reviewed were working from their offices or in the laboratory, so maybe the result will be different if the participants are working from home instead of onsite.

Future studies should look more into the effect of the number of children. As shown by the result, the number of children is a significant predictor of burnout and overtime worked. The number of children is also closely tight to a family's financial responsibility. As it is very costly to raise a child, the higher number of children one family has, the heavier financial responsibility one will have. Future studies can investigate the differences of number of children and its effect on burnout, illness, and health behaviors. Future studies should also try doing longitudinal studies to observe if burnout, illness, and health outcomes will change if the number of children and the overtime worked hour change.

Researchers can follow up a group of people and observe the relationship of overtime and burnout, illness, and health outcome over the spam of different years to see if age plays a factor in those variables. If possible, researchers can also do an experiment and manipulate overtime worked, to see its effect on burnout, illness, and health outcomes.

# APPENDIX A

## INSERT APPENDIX TITLE HERE

INFORMED CONSENT

Purpose: To investigate the relationship between overtime, burnout, illness and health outcomes.

Description of Research: Responses will be collected from participants. Responses will be used in a graduate-level thesis.

Duration: Responding to the questions on the survey will require between 15 to 5-15 minutes.

Risks: The risk associated with this study is low and no more than would be encountered with daily activities. The nature of the questions are non-invasive.

Participation: Your participation in this study is entirely voluntary. You can skip questions or withdraw from this study at any time without any negative consequences.

Confidentiality: Information collected for this study will be strictly confidential, and all records of this study will only be accessed by the primary investigator. Any and all identifying information will be excluded from any and all reports. Information from this study will only be presented at the group level with all identifying information removed.

Data Storage: Original responses will be stored on a password-protected server via Qualtrics.

Results:  A report of the study findings will be compiled and presented in an applied project.

CONTACT: In case of questions or if there are concerns, problems, or other issues, the researcher, Leona Zhang, can be contacted at 007745134@coyote.csusb.edu.

CONFIRMATION STATEMENT:

I have read the information above and agree to participate in your study.

By selecting the option to continue, I affirm that I understand the above information and that I am taking part in this study voluntarily with the option to end my participation at any time with no penalty or negative consequence for voluntarily ending my participation. I also acknowledge that I am at least 18 years of age.

# APPENDIX B

SCALES

**DEMOGRAPHIC INFORMATION**

What is your gender?

Male

Female

Non-binary

Not listed

Prefer Not to Answer

What is your age in years?

Scale from 18 to 100.

How many children do you have?

0

1

2

3

4

5+

What is your ethnicity?

White

Black or African American

American Indian or Alaska Native

Asian

Native Hawaiian or Pacific Islander

Not listed

Prefer not to answer

I work as a...

Part time employee

Full time employee

Rate your emotion during your overtime worked using a slide bar with 0 being very upset and 100 being very happy during the last time you have worked overtime.

Emotion during overtime worked, slider bar from 0 to 100

Do you work in extended work shifts?

Extended work shifts: 10- or 12-hour shifts were compared with 8-hour shifts in most studies and used a standard 40-hour work week.

Yes

No

On average, how many hours of overtime do you work weekly? (Work hours that exceeds 40 hours per week are considered as overtime)

Slider bar from 0 hours to 100 hours

I am willing to work overtime

- Disagree
- Somewhat Disagree
- Neither Disagree nor Agree
- Somewhat Agree
- Agree

**ATTENTION CHECK QUESTIONS**

There are many important issues facing organizations today. Research shows that issues people think are important can affect their views on other issues. We want to know if you are paying attention. Please ignore the question and select "overtime." Please select the most important issue that organizations are facing.

- Crime
- Turnover
- Overtime
- Other
- Theft

Show you are paying attention by selecting Agree with the statement below.

- Strongly Agree
- Agree
- Somewhat agree
- Neither agree or disagree
- Somewhat disagree
- Disagree
- Strongly disagree

I have responded honestly to this survey. Please use my data in your study.

- Yes

No

THE MASLACH BURNOUT INVENTORY – EMOTIONAL EXHAUSTION SCALE (MASLACH, 1997)

The Maslach Burnout Inventory (MBI) is the most commonly used tool to self-assess whether you might be at risk of burnout. To determine the risk of burnout, the MBI explores three components: exhaustion, depersonalization and personal achievement. While this tool may be useful, it must not be used as a scientific diagnostic technique, regardless of the results. The objective is simply to make you aware that anyone may be at risk of burnout.

For each question, indicate the score that corresponds to your response.

0 – Never

1 – At least a few times within the past six months

2 – At least once in the past month

3 – Several times a month

4 – Once a week

5 – Several times a week

6 – Every day

*Items*

1. I feel emotionally drained by my work.
2. Working with people all day long requires a great deal of effort.
3. I feel like my work is breaking me down.
4. I feel frustrated by my work.

5. I feel I work too hard at my job.
6. It stresses me too much to work in direct contact with people.

THE PHYSICAL SYMPTOMS INVENTORY (SPECTOR & JEX, 1998)

The Physical Symptoms Inventory is a 13-item, which uses a 5-point Likert scale, with 1, which means not at all to 5, which means every day.

Over the past month, how often have you experienced each of the following symptoms?

Not at all

Once or Twice per month

Once or twice per week

Most days

Every day

*Items*

1. An upset stomach or nausea
2. A backache
3. Headache
4. Acid indigestion or heartburn
5. Eye strain
6. Diarrhea
7. Stomach cramps - Not menstrual
8. Constipation
9. Ringing in ears
10. Loss of appetite
11. Dizziness

12. Tiredness or fatigue
13. Trouble sleeping

THE HEALTH OUTCOME INVENTORY

The Health Outcome Inventory is a self-designed, 6-item, which uses a 5-point Likert scale, with 1, which means not at all to 5, which means every day.

Over the past month, how often have you experienced each of the following symptoms?

Not at all

Once or Twice per month

Once or twice per week

Most days

Every day

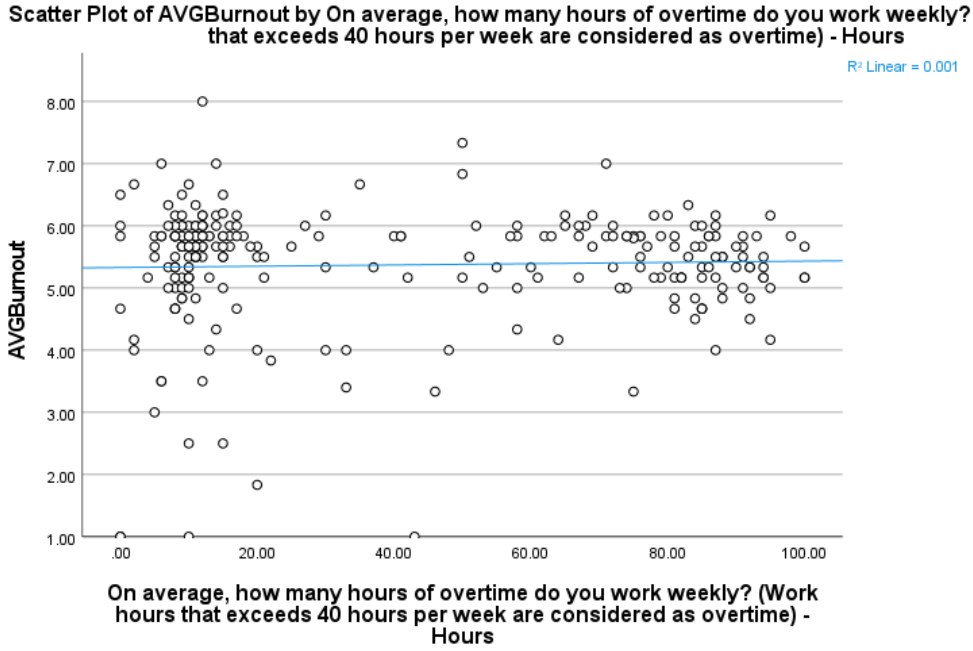
*Items*

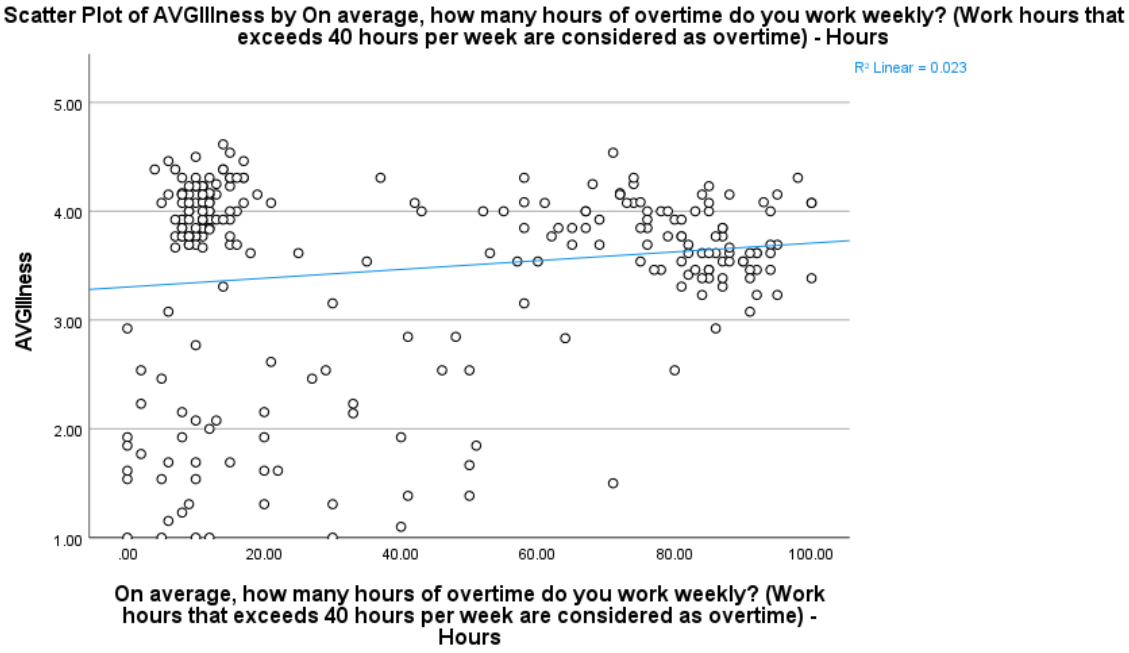
1. Smoking
2. Exercising
3. Drinking
4. Using recreational drugs or other substances
5. Eating healthy
6. Resting well

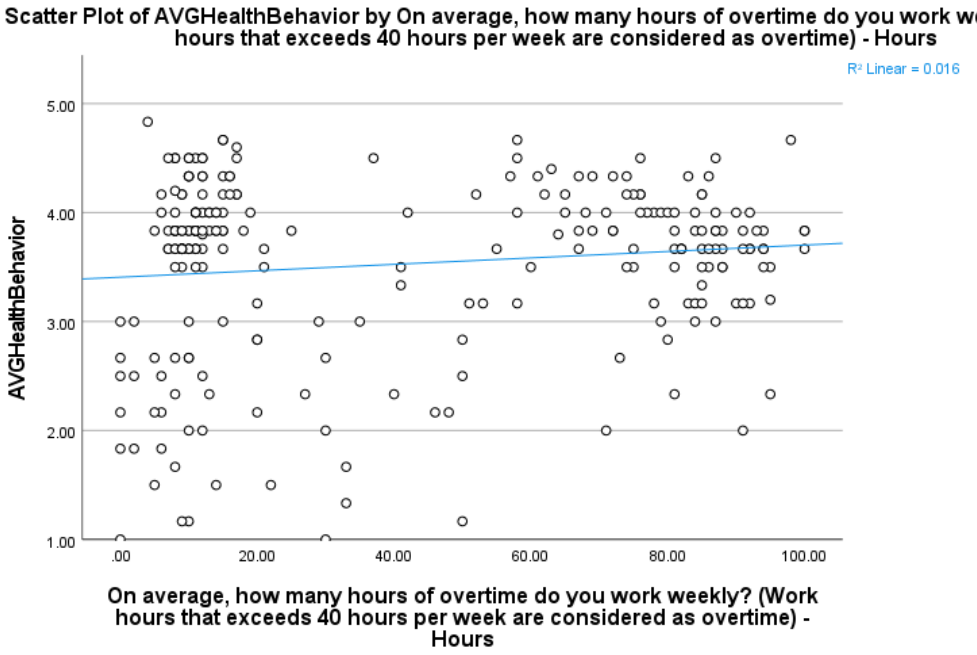
# APPENDIX C

## SCATTERPLOTS AND ADDITIONAL INFORMATION

SCATTER PLOTS




Scatter Plot of AVGHealthBehavior by On average, how many hours of overtime do you work weekly? (Work hours that exceeds 40 hours per week are considered as overtime) - Hours
R² Linear = 0.016
AVGHealthBehavior
5.00
4.00
3.00
2.00
1.00
.00
20.00
40.00
60.00
80.00
100.00
On average, how many hours of overtime do you work weekly? (Work hours that exceeds 40 hours per week are considered as overtime) - Hours

SPLIT FILE - GENDER

*Correlations*

| What is your gender? - Selected Choice | | | AVGBurnout | AVGIllness | AVGHealthBehavior | How many children do you have? | What is your gender? - Selected Choice |
|---|---|---|---|---|---|---|---|
| . | AVGBurnout | Pearson Correlation | .[a] | .[a] | .[a] | .[a] | .[a] |
| | | Sig. (2-tailed) | . | . | . | . | . |
| | | N | 2 | 2 | 2 | 1 | 0 |
| | AVGIllness | Pearson Correlation | .[a] | 1 | 1.000** | .[a] | .[a] |
| | | Sig. (2-tailed) | . | . | . | . | . |
| | | N | 2 | 2 | 2 | 1 | 0 |
| | AVGHealthBehavior | Pearson Correlation | .[a] | 1.000** | 1 | .[a] | .[a] |
| | | Sig. (2-tailed) | . | . | . | . | . |
| | | N | 2 | 2 | 2 | 1 | 0 |
| | How many children do you have? | Pearson Correlation | .[a] | .[a] | .[a] | .[a] | .[a] |
| | | Sig. (2-tailed) | . | . | . | | . |
| | | N | 1 | 1 | 1 | 1 | 0 |
| | What is your gender? - Selected Choice | Pearson Correlation | .[a] | .[a] | .[a] | .[a] | .[a] |
| | | Sig. (2-tailed) | . | . | . | . | |
| | | N | 0 | 0 | 0 | 0 | 0 |
| Male | AVGBurnout | Pearson Correlation | 1 | .495** | .432** | .286** | .[a] |
| | | Sig. (2-tailed) | | <.001 | <.001 | .003 | . |
| | | N | 103 | 103 | 103 | 103 | 103 |
| | AVGIllness | Pearson Correlation | .495** | 1 | .878** | .353** | .[a] |
| | | Sig. (2-tailed) | <.001 | | <.001 | <.001 | . |
| | | N | 103 | 104 | 103 | 104 | 104 |
| | AVGHealthBehavior | Pearson Correlation | .432** | .878** | 1 | .393** | .[a] |
| | | Sig. (2-tailed) | <.001 | <.001 | | <.001 | . |
| | | N | 103 | 103 | 103 | 103 | 103 |
| | How many children do you have? | Pearson Correlation | .286** | .353** | .393** | 1 | .[a] |
| | | Sig. (2-tailed) | .003 | <.001 | <.001 | | . |
| | | N | 103 | 104 | 103 | 104 | 104 |
| | What is your gender? - Selected Choice | Pearson Correlation | .[a] | .[a] | .[a] | .[a] | .[a] |
| | | Sig. (2-tailed) | . | . | . | . | . |
| | | N | 103 | 104 | 103 | 104 | 104 |
| Female | AVGBurnout | Pearson Correlation | 1 | .432** | .387** | .262** | .[a] |
| | | Sig. (2-tailed) | | <.001 | <.001 | .004 | . |
| | | N | 117 | 117 | 116 | 117 | 117 |
| | AVGIllness | Pearson Correlation | .432** | 1 | .838** | .604** | .[a] |
| | | Sig. (2-tailed) | <.001 | | <.001 | <.001 | . |
| | | N | 117 | 117 | 116 | 117 | 117 |
| | AVGHealthBehavior | Pearson Correlation | .387** | .838** | 1 | .562** | .[a] |
| | | Sig. (2-tailed) | <.001 | <.001 | | <.001 | . |
| | | N | 116 | 116 | 116 | 116 | 116 |
| | How many children do you have? | Pearson Correlation | .262** | .604** | .562** | 1 | .[a] |
| | | Sig. (2-tailed) | .004 | <.001 | <.001 | | . |
| | | N | 117 | 117 | 116 | 117 | 117 |
| | What is your gender? - Selected Choice | Pearson Correlation | .[a] | .[a] | .[a] | .[a] | .[a] |
| | | Sig. (2-tailed) | . | . | . | . | . |
| | | N | 117 | 117 | 116 | 117 | 117 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| I prefer to self-identify as | AVGBurnout | Pearson Correlation | 1 | .327 | .000 | -.500 | [a] |
| | | Sig. (2-tailed) | | .788 | 1.000 | .667 | . |
| | | N | 3 | 3 | 3 | 3 | 3 |
| | AVGIllness | Pearson Correlation | .327 | 1 | .945 | .655 | [a] |
| | | Sig. (2-tailed) | .788 | | .212 | .546 | . |
| | | N | 3 | 3 | 3 | 3 | 3 |
| | AVGHealthBehavior | Pearson Correlation | .000 | .945 | 1 | .866 | [a] |
| | | Sig. (2-tailed) | 1.000 | .212 | | .333 | . |
| | | N | 3 | 3 | 3 | 3 | 3 |
| | How many children do you have? | Pearson Correlation | -.500 | .655 | .866 | 1 | [a] |
| | | Sig. (2-tailed) | .667 | .546 | .333 | | . |
| | | N | 3 | 3 | 3 | 3 | 3 |
| | What is your gender? - Selected Choice | Pearson Correlation | [a] | [a] | [a] | [a] | [a] |
| | | Sig. (2-tailed) | . | . | . | . | |
| | | N | 3 | 3 | 3 | 3 | 3 |
| Prefer Not to Answer | AVGBurnout | Pearson Correlation | 1 | -1.000** | -1.000** | 1.000** | [a] |
| | | Sig. (2-tailed) | | . | . | . | . |
| | | N | 2 | 2 | 2 | 2 | 2 |
| | AVGIllness | Pearson Correlation | -1.000** | 1 | 1.000** | -1.000** | [a] |
| | | Sig. (2-tailed) | . | | . | . | . |
| | | N | 2 | 2 | 2 | 2 | 2 |
| | AVGHealthBehavior | Pearson Correlation | -1.000** | 1.000** | 1 | -1.000** | [a] |
| | | Sig. (2-tailed) | . | . | | . | . |
| | | N | 2 | 2 | 2 | 2 | 2 |
| | How many children do you have? | Pearson Correlation | 1.000** | -1.000** | -1.000** | 1 | [a] |
| | | Sig. (2-tailed) | . | . | . | | . |
| | | N | 2 | 2 | 2 | 2 | 2 |
| | What is your gender? - Selected Choice | Pearson Correlation | [a] | [a] | [a] | [a] | [a] |
| | | Sig. (2-tailed) | . | . | . | . | |
| | | N | 2 | 2 | 2 | 2 | 2 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

REFERENCES

Artazcoz, L., Cortès, I., Escribà-Agüir, V., Cascant, L., & Villegas, R. (2009). Understanding the relationship of long working hours with health status and health-related behaviours. *Journal of Epidemiology & Community Health*, *63*(7), 521-527.

Albendín, L., Gómez, J. L., Cañadas-de la Fuente, G. A., Cañadas, G. R., San Luis, C., & Aguayo, R. (2016). Prevalencia bayesiana y niveles de burnout en enfermería de urgencias. Una revisión sistemática. *Revista Latinoamericana de Psicología*, *48*(2), 137-145.

Åkerstedt, T., Knutsson, A., Westerholm, P., Theorell, T., Alfredsson, L., & Kecklund, G. (2004). Mental fatigue, work and sleep. *Journal of psychosomatic Research*, *57*(5), 427-433.

Bannai, A., & Tamakoshi, A. (2014). The association between long working hours and health: a systematic review of epidemiological evidence. *Scandinavian journal of work, environment & health*, 5-18.

Bakker, A. B., Le Blanc, P. M., & Schaufeli, W. B. (2005). Burnout contagion among intensive care nurses. *Journal of advanced nursing*, *51*(3), 276-287.

Bergqvist U, Wolgast E, Nilsson B, Voss M. The influence of VDT work on musculoskeletal disorders. Ergonomics 1995; 38: 754-762.

Brown, G. T., & Pranger, T. (1992). Predictors of burnout for psychiatric occupational therapy personnel. *Canadian Journal of Occupational Therapy*, *59*(5), 258-267.

Donald, I. A. N., & Siu, O. L. (2001). Moderating the stress impact of environmental conditions: The effect of organizational commitment in Hong Kong and China. *Journal of Environmental Psychology*, *21*(4), 353-368.

Ettner, S. L., & Grzywacz, J. G. (2001). Workers' perceptions of how jobs affect health: a social ecological perspective. *Journal of occupational health psychology*, *6*(2), 101.

Fredriksson, K., Alfredsson, L., Köster, M., Thorbjörnsson, C. B., Toomingas, A., Torgén, M., & Kilbom, A. (1999). Risk factors for neck and upper limb disorders: results from 24 years of follow up. *Occupational and environmental medicine*, *56*(1), 59-66.

Garden, A. M. (1991). Relationship between burnout and performance. *Psychological Reports*, *68*(3), 963-977.

Hetrick, R. L. (2000). Analyzing the recent upward surge in overtime hours. *Monthly Lab. Rev.*, *123*, 30.

Hornberger, S., & Knauth, P. (1998). Follow-up intervention study on effects of a change in shift schedule on shiftworkers in the chemical industry. *International journal of industrial ergonomics*, *21*(3-4), 249-257.

Jiang, S., Jiang, C., & Cheng, Y. (2022). Working Overtime in Social Work Settings: \ Associations with Burnout, Person-organization Value Congruence and Turnover Intentions among Chinese Social Workers. *Human Service Organizations: Management, Leadership & Governance*, 1-14.

Johnson, J. V., & Lipscomb, J. (2006). Long working hours, occupational health and the changing nature of work organization. *American journal of industrial medicine*, *49*(11), 921-929.

Kawakami, N., Araki, S., Takatsuka, N., Shimizu, H., & Ishibashi, H. (1999). Overtime, psychosocial working conditions, and occurrence of non-insulin dependent diabetes mellitus in Japanese men. *Journal of Epidemiology & Community Health*, *53*(6), 359-363.

Maslach, C., & Leiter, M. P. (2006). Burnout. *Stress and quality of working life: current perspectives in occupational health*, *37*, 42-49.

Melamed, S., Shirom, A., Toker, S., Berliner, S., & Shapira, I. (2006). Burnout and risk of cardiovascular disease: evidence, possible causal paths, and promising research directions. *Psychological bulletin*, *132*(3), 327.

Mizoue, T., Reijula, K., & Andersson, K. (2001). Environmental tobacco smoke exposure and overtime work as risk factors for sick building syndrome in Japan. *American journal of epidemiology*, *154*(9), 803-808.

Mitchell, R. J., & Williamson, A. M. (2000). Evaluation of an 8 hour versus a 12 hour shift roster on employees at a power station. *Applied ergonomics*, *31*(1), 83-93.

National Research Council. (2004). *Monitoring International Labor Standards: International Perspectives: Summary of Regional Forums*. National Academies Press.

Nakano, Y., Nakamura, S., Hirata, M., HARADA, K., ANDO, K., TABUCHI, T., ... & ODA, H. (1998). Immune function and lifestyle of taxi drivers in Japan. *Industrial Health*, *36*(1), 32-39.

Nakamura, K., Shimai, S., Kikuchi, S., Takahashi, H., Tanaka, M., Nakano, S., ... & Yamamoto, M. (1998). Increases in body mass index and waist circumference as outcomes of working overtime. *Occupational Medicine*, *48*(3), 169-173.

Nakanishi, N., Okamoto, M., Yoshida, H., Matsuo, Y., Suzuki, K., & Tatara, K. (2003). Serum uric acid and risk for development of hypertension and impaired fasting glucose or Type II diabetes in Japanese male office workers. *European journal of epidemiology*, *18*(6), 523-530.

Nylen, L., Voss, M., & Floderus, B. (2001). Mortality among women and men relative to unemployment, part time work, overtime work, and extra work: a study based on data from the Swedish twin registry. *Occupational and environmental medicine*, *58*(1), 52-57.

Rosa, R. R., Bonnet, M. H., & Cole, L. L. (1998). Work schedule and task factors in upper-extremity fatigue. *Human factors*, *40*(1), 150-158.

Lin, R. T., Lin, Y. T., Hsia, Y. F., & Kuo, C. C. (2021). Long working hours and burnout in health care workers: Non-linear dose-response relationship and the effectmediated by sleeping hours-A cross-sectional study. *Journal of occupational health*, *63*(1), e12228.

Lipscomb, J. A., Trinkoff, A. M., Geiger-Brown, J., & Brady, B. (2002). Work-schedule characteristics and reported musculoskeletal disorders of registered nurses. *Scandinavian journal of work, environment & health*, 394-401.

Liu, Y., & Tanaka, H. (2002). Overtime work, insufficient sleep, and risk of non-fatal acute myocardial infarction in Japanese men. *Occupational and Environmental Medicine*, *59*(7), 447-451.

Luther, L., Gearhart, T., Fukui, S., Morse, G., Rollins, A. L., & Salyers, M. P. (2017). Working overtime in community mental health: Associations with clinician burnout and perceived quality of care. *Psychiatric Rehabilitation Journal*, *40*(2), 252.

Peterson, S. A., Wolkow, A. P., Lockley, S. W., O'Brien, C. S., Qadri, S., Sullivan, J. P., ... & Barger, L. K. (2019). Associations between shift work characteristics, shift work schedules, sleep and burnout in North American police officers: a cross-sectional study. *BMJ open*, *9*(11), e030302.

Pines, A. M., Neal, M. B., Hammer, L. B., & Icekson, T. (2011). Job burnout and couple burnout in dual-earner couples in the sandwiched generation. *Social Psychology Quarterly*, *74*(4), 361-386.

Shields, M. (2000). Long working hours and health. *Perspectives on labour and income*, *12*(1), 49.

Sigurdson, K., & Ayas, N. T. (2007). The public health and safety consequences of sleep disorders. *Canadian journal of physiology and pharmacology*, *85*(1), 179-183.

Swanson, D., Block, R., & Mousa, S. A. (2012). Omega-3 fatty acids EPA and DHA: health benefits throughout life. *Advances in nutrition*, *3*(1), 1-7.

Toker, S., & Biron, M. (2012). Job burnout and depression: unraveling their temporal relationship and considering the role of physical activity. *Journal of Applied Psychology*, *97*(3), 699.

Trinkoff, A. M., & Storr, C. L. (1998). Work schedule characteristics and substance use in nurses. *American journal of industrial medicine*, *34*(3), 266-271.

Van der Hulst, M., & Geurts, S. (2001). Associations between overtime and psychological health in high and low reward jobs. *Work and stress*, *15*(3), 227-240.

Voss, M., Floderus, B., & Diderichsen, F. (2001). Physical, psychosocial, and organisational factors relative to sickness absence: a study based on Sweden Post. *Occupational and Environmental Medicine*, *58*(3), 178-184.

Wong, K., Chan, A. H., & Ngan, S. C. (2019). The effect of long working hours and overtime on occupational health: a meta-analysis of evidence from 1998 to 2018. *International journal of environmental research and public health*, *16*(12), 2102.

Worrall, L., & Cooper, C. L. (1999). Working patterns and working hours: their impact on UK managers. *Leadership & Organization Development Journal*.