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# The Impact of Job Characteristics on Worker Health

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## Abstract

Work is a very important part of our everyday lives. Furthermore, the landscape of work in the U.S. has changed dramatically over the past 15-20 years in response to economic shifts and an increasingly global economy. Therefore, it is important to understand changing workplace characteristics that impact our lives. Additionally, there is a large body of workplace literature across disciplines that indicate a variety of job quality indicators and workplace characteristics (i.e. job security, pay, worker autonomy, interesting work, etc.) that may have an impact health. These health impacts have potentially serious implications for business, family, and society as a whole. Through a review of the existing literature, this paper seeks to better understand the role of these workplace characteristics in determining worker health. More specifically, I will address the following three questions in this paper: (1) What is the relationship between job characteristics and worker health?, (2) What are the prevailing methodological approaches in exploring the link between job characteristics and health?, and (3) What are the policy implications of the findings in the existing research? Finally, I will discuss the policy implications that current research findings, while providing several suggestions for policy interventions on the part of employers, families, and public policy makers to help increase worker health and limit potential hazardous workplace conditions that could result in poor worker health.

## INTRODUCTION

### RESEARCH PROBLEM

Work is a very important part of our everyday lives. In fact, many individuals spend one-half or more of their waking hours in the workplace. Additionally, the landscape of work in the U.S. has changed dramatically over the past 15-20 years in response to economic shifts and an increasingly global economy. Jamison, et al. (2004) provide a nice summary of this perspective:

“Today, work, with its attendant management hierarchies and educational requirements, organizational mergers, and company buyouts, layoffs, and downsizing, contingent work and job insecurity, is undergoing a radical transformation that threatens the structure of the job as we have come to know. The work environment in which we today spend so much of our daily lives is thus likely to present an entirely new range of work environment stressors that are associated with various symptoms of ill health” (p. 43).

Therefore, as work makes up such a dominate portion of our lives, and as the nature of work has been changing in recent decades, it is important to understand workplace characteristics that impact our lives.

Furthermore, there is a large body of workplace literature

across disciplines that indicate a variety of job quality indicators and workplace characteristics (i.e. job security, pay, worker autonomy, interesting work, etc.) that may have an impact health. These health impacts have potentially serious implications for business, family, and society as a whole. In the world of business, poor health can lead to high absenteeism and lower worker productivity, which can impact a firm's business costs and overall competitiveness. In the home, poor health caused by work characteristics can impact familial relations, as well as a bread-winners ability to hold down consistent and regular employment. As a society as a whole, the general health of the populous has serious policy implications and potentially high social costs. Therefore, it is important for employers, households and families, and public policy makers to understand the role that workplace characteristics play in the health of the individual and take preventative actions to maintain worker health.

### RESEARCH QUESTIONS

Recognizing the important role that work plays in most peoples' lives, in addition to acknowledging employer, family, and societal interests in keeping individuals healthy, this paper seeks to better understand the role of workplace characteristics in determining worker health. More specifically, I will address the following three questions in

this paper:

1. What is the relationship between job characteristics and worker health?
2. What are the prevailing methodological approaches in exploring the link between job characteristics and health?
3. What are the policy implications of the findings in the existing research?

In the remainder of this paper I will attempt to answer the three research questions above, while providing evidence from the existing literature on the workplace and health to identify the important indicators of worker health and health behaviors, as well as explore worker health difference by gender and sector. In addition, I will provide some critiques of study methodologies in the current literature, while providing some discussion on future research directions. Finally, I will discuss the policy implications that current research findings, while providing several suggestions for policy interventions on the part of employers, families, and public policy makers to help increase worker health and limit potential hazardous workplace conditions that could result in poor worker health.

### ARTICLE SELECTION METHOD

For this literature review, I conducted an EBSCO Host database search (specifically Academic Search Premiere and MedLine databases) of peer-reviewed academic journal articles between the years of 2003-2006, using the search terms, “job characteristics and health,” and “job satisfaction and worker health.” This search produced 23 article abstracts, which I read to determine which articles I would include in the review for this paper. I included articles that addressed key aspects of the research question, while attempting to provide an inclusive and more comprehensive view of the work conditions and health literature.

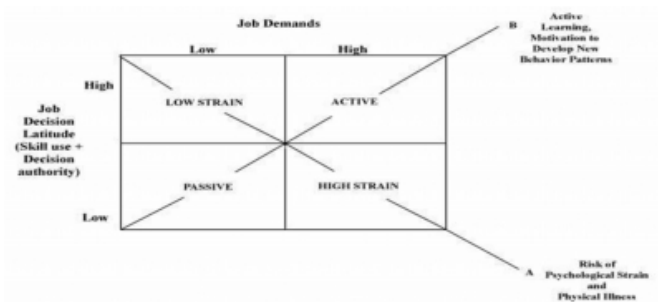
### REVIEW OF LITERATURE AND KEY FINDINGS RESEARCH FOUNDATIONS AND KARASEK'S JOB STRAIN MODEL

What does the existing workplace and health literature say about the relationship between job characteristics and worker health? The foundation for most research in this field is Karasek's (1979) job strain model (depicted in Figure 1 below). In this model, two key work characteristics—(1) one's job demands and (2) the level of one's decision

latitude—combine to determine the risk of psychological strain and physical illness. If one has high job demands and low decision latitude, the likelihood of illness is high. On the other hand, if either job demands are low or decision latitude is high, there would be less risk for psychological strain and physical illness.

**Figure 1**

Figure 1: Karasek Job Strain Model



Despite the wide use of Karasek's model in the literature (as well as variations such as the demand-control-support model), empirical evidence for this model is mixed (Totterdell, Wood, and Wall, 2006).

Some studies have been designed specifically to test the job strain model and its variations (Totterdell, Wood, and Wall, 2006; Tsutsumi 2005), while others explore the link between psychosocial working conditions and health (Jamison, Wallace, and Jamison, 2004; Bogart, Vranceanu, and Walt, 2004; Sundquist et al., 2003). Still, other studies look more into workers' physical health, as related to repetitive strain (Cole, Ibrahim, and Shannon, 2005), in addition to examining the link between job characteristics and health behaviors (Tsutsumi, 2005; Tsutsumi, et al., 2003). Finally, several studies explore worker health difference by gender and sector (Bekker, Croon, and Bressers, 2005; Jamison, Wallace, and Jamison, 2004; Bogart, Vranceanu, and Walt, 2004; Morrison and Payne, 2003; Tsutsumi et al 2003), while examining job characteristics as mediators of the SES-health relationship (Warren, et al., 2004). In the remainder of this section, I will review these studies, briefly discussing the study designs and key findings.

### TESTING JOB STRAIN AND JOB DEMAND-CONTROL

A few studies reviewed for this paper explicitly attempted to test Karasek's job strain model. Totterdell, Wood, and Wall (2006) utilized a time-sampling methodology with a group of portfolio workers to take a new approach at testing Karasek's (1979) job strain model—high demands, low

control, and low social support produce psychological strain—noting that existing evidence from the job strain model is mixed. They used a convenience sample of 65 workers (between the ages of 26 and 77) who were self-employed. Participants completed a diary questionnaire every week for 26 weeks, in addition to a survey questionnaire at the beginning and end of the project. They examined these diaries to see whether working weeks that involve more of these characteristics produce greater psychological strain. They further tested whether worker optimism moderates the relationship between these job characteristics and psychological strain. The before and after questionnaire measured the following: optimism, emotional stability, problem solving demands, timing and method control, emotional social support, and job-related strain. The diary measured work demands, job control, social support, and psychological strain. Using multilevel regression modeling, the researchers found that the highest levels of strain were experienced by pessimists under conditions of low control and high demands. Finally, the researchers noted that the study findings point to the importance of understanding the work context in framing the job strain model.

Tsutsumi (2005) analyzed data from the Jichi Medical School Study (JMS)—a cohort study that studies the risk factors of cardiovascular disease among the Japanese—to test the classic job strain model, as well as develop a new Effort-Reward Imbalance Model (ERI) to describe Japanese workers. The JMS collected data on nearly 12,500 Japanese workers between the years of 1992-1995, with an overall response rate of 65.4%. In addition to several findings with implications for health behaviors (these findings will be noted in a later section), Tsutsumi found that the psychosocial job characteristics defined by the job demand-control model predict cardiovascular disease among Japanese workers.

Both studies above supported aspects of Karasek's job strain model—namely that job demands and decision latitude are important psychosocial work characteristics that have implications for health and health behaviors. While Tsutsumi (2005) found direct empirical evidence among Japanese workers to support Karasek's job strain model, Totterdell, Wood, and Wall (2006) also emphasized the importance of understanding the work context when examining these classic job strain variables. More will be noted on the strengths and limitations of the study methodologies in the critique section.

## **PSYCHOSOCIAL WORKING CONDITIONS AND HEALTH**

An extension of the job strain model research is a body of studies that explores additional areas of psychosocial working conditions, including an important indicator left out of Karasek's job strain model—social support. Jamison, Wallace, and Jamison (2004) investigated the impact of contemporary work characteristics on worker stress and overall health. Using 1998 telephone survey data from the Indiana Survey of Work in a Polarized Economy, they measured occupational status, organizational disruption, layoff experience, and educational discordance of 919 survey participants (response rate of 78%) and analyzed how these factors impacted ill health among, while controlling for sociodemographic (gender, ethnicity, age, marital status), lifestyle (frequency of exercise, use of tobacco products, use of alcohol), and job characteristics (sector, self-employed status, job satisfaction, control of the pace of work, job autonomy, irregular shifts, computer hours). Using multiple regression analysis, the researchers found that occupational status is negatively associated with ill health. On the other hand, organizational disruption, layoff experience, and educational discordance were all positively associated with ill health. Finally, they found that job satisfaction is negatively related to ill health.

Additionally, Bogart, Vranceanu, and Walt (2004) examined the independent and joint effects of occupational status and perceived demands, control, and social support at work on ambulatory systolic blood pressure and heart rate in women. Using self-report assessment data collected from 114 self-referred women participants, the researchers measured job control, demands, and support, in addition to measuring ambulatory systolic blood pressure over a two-day period, while controlling for occupational status. Using ANOVA analysis, the researchers found that occupational status and job characteristics accounted for 18% and 22% of the inter-individual variability in ambulatory systolic blood pressure. Finally, they found that women with both low status occupations and stressful job circumstances are at a disproportionately high risk of cardiovascular illness.

Finally, Sundquist et al (2003) examined the cross-sectional relationship between migration status and job characteristics, specifically looking at the association between high psychological demands and low decision latitude, as well as work related social support and long-term illness, based on migration status. Using four waves of the Swedish Annual Level of Living Survey (1994-1997), the researchers looked

at measures of various background variables (age, marital status, migration status, SES), working conditions (psychological job demands, job decision latitude, job strain, work-related social support), and self-reported long-term illness. The researchers then used logistic regression to look at a random sample of employed Swedish-born, labor immigrants, and refugees. They found that refugees had a greater risk of long-term illness than did Swedish-born individuals. They further found that high job demands and low decision latitude resulted in an increased risk of long-term illness.

These studies also support Karasek's job strain model, while emphasizing the importance of other psychosocial factors, such as social support. It is understandable that social support would play a significant role in one's experience of job demands and decision latitude. Indeed, in instances where demands are high and decision latitude is low, high levels of support have been shown to smooth out the negative impact. Therefore, social support is an important variable to consider when looking at job characteristics and worker health.

### **PHYSICAL HEALTH AND REPETITIVE STRAIN**

In addition to the research of work conditions and psychological and physical health, another important area of this literature addresses repetitive strain injuries in relation to worker physical health. Cole, Ibrahim, and Shannon (2005) examined the predictors of work-related repetitive strain injuries using data from four waves of the Canadian National Population Survey (CNPS). The CNPS utilized a stratified, multistage sample design to randomly select around 20,000 households. The researchers focused on respondents who were between the ages of 18-64 in 1994-1995, had paid employment, responded additionally to an abbreviated set of items from the Job Content Questionnaire, and did not experience repetitive strain injuries prior to 2000-2001. They found that female gender, some college or university education, job insecurity, high physical exertion levels, and high levels of psychological demands were all positively associated with work-related repetitive strain injuries.

In addition to the main study findings, the researchers noted that the main predictors of repetitive strain injuries are modifiable, and thus steps can be taken to reduce the number of repetitive strain injuries experienced by workers. I will discuss this more in the policy prescriptions section.

### **JOB CHARACTERISTICS AND HEALTH**

### **BEHAVIORS**

In addition to the direct impacts of work characteristics on worker health, other studies look at the impact work characteristics have on worker health behaviors, which then in turn impact worker health. In a similar study to the one sole-authored by Tsutsumi (already reviewed above) Tsutsumi et al (2003) examined the association between job characteristics and health behaviors in Japanese rural workers. Using data from the Jichi Medical School Cohort Study, the researchers analyzed responses from nearly 6800 working men and women under the age of 65 to measure job characteristics, job demands, and job control, while controlling for a wide variety of sociodemographic variables. Using ANOVA analysis, the researchers in both studies found that high psychological demands were associated with heavy smoking and alcohol consumption, as well as high work-related physical activity. Furthermore, low job control was associated with lower consumption of vegetables, less smoking, and a lower level of work-related physical activity. Additionally, job strain was associated with lower vegetable consumption, less smoking, and greater alcohol consumption.

Although, within the scope of this paper, I have not included other studies on psychosocial factors and health behaviors, or the impact of health behaviors on one's health, there is a large body of literature examining those links. Furthermore, the findings of Tsutsumi (2005) and Tsutsumi et al (2003) only support other research findings, while looking directly at psychosocial characteristics within the workplace. Additionally, these findings are important because they examine a population of Japanese workers, not previously studied extensively in the workplace characteristics and health literature.

### **GENDER DIFFERENCES**

Another important aspect of the workplace and health research is a look at potential gender differences in the impacts of particular work characteristics on health. The research on gender differences has produced inconsistent and sometimes contradicting results. Some researchers have found key gender differences in the impact of key variables on ill health (Jamison, Wallace, and Jamison, 2004; Tsutsumi, et al., 2003). For example, Bogart, Vranceanu, and Walt (2004) found that women with both low status occupations and stressful job circumstances are at a disproportionately high risk of cardiovascular illness. Additionally, Cole, Ibrahim, and Shannon (2005) found that female gender was positively associated with work-related

repetitive strain injuries.

However, other researchers have had less clear results on the differences between health outcomes by gender. For example, Morrison and Payne (2003) examine the effect of gender on the relationship between work characteristics, job satisfaction, and psychological distress. Using a sample of nearly 6800 hospital workers in 81 different jobs, the researchers analyzed questionnaire responses to measure work characteristics, job satisfaction, and worker distress. They found that job characteristics have predictable effects on men's health, but not on women's health.

Furthermore, Bekker, Croon, and Bressers (2005) investigated the role of childcare involvement, job characteristics, gender, and worker attitudes on emotional exhaustion and sickness absence from work. They used a voluntary questionnaire among 404 male and female nurses in an institution for individuals with learning disabilities in the Netherlands, to measure demographic and job characteristics, work and non-work attitudes, and emotional exhaustion (response rate of 47%). Though it was expected that women would have higher levels of emotional exhaustion and absenteeism, it was found through regression analysis that women did not have higher levels of absenteeism and that men had higher levels of emotional exhaustion, linked to having significantly more working hours. Finally, the researchers found that a combination of work load and care load predicted emotional exhaustion and sickness absence from work.

Overall, these studies seem to support other broader research on the differences between genders, with regards to psychosocial characteristics and health outcomes. However, it is surprising to see the inconsistency with regards to the role of gender in the findings of the studies cited above. While the majority of the studies found that females are more likely to experience ill health, others found the opposite to be true. The surprising findings may be a result of the study population (looking at a voluntary sample of male and female nurses and other hospital workers), and if these studies were to include other occupation types within the sample, the findings may have been different. Therefore, I believe that this question warrants further investigation.

### **PRIVATE/PUBLIC SECTOR DIFFERENCES**

In addition to gender differences, one study found a difference in the impact of job characteristics by private and public sectors. In Jamison, Wallace, and Jamison's study described previously (2004), the researchers found that

workers in government jobs were significantly more likely to experience ill health, though the researchers did not provide any clear explanations for why this is the case. In some ways this may seem counterintuitive in light of classical job strain model predictions and the stereotypical public perception that government jobs may be less demanding than similar jobs in the private sector. However, government jobs also often involve a great deal of organizational red tape and hierarchal levels of bureaucracy, which may greatly reduce a worker's decision latitude, possibly more so than similar private sector jobs. Whatever the explanation, this finding warrants further research.

### **JOB CHARACTERISTICS AS MEDIATORS OF SES-HEALTH RELATIONSHIP**

Finally, much research has looked at the link between one's SES and health outcomes. Warren, et al. (2004) examined the mechanisms that link SES and health, focusing in on job characteristics as mediators for this relationship. Using data from the Wisconsin Longitudinal Study (1992), which measures physical and psychosocial characteristics of paid employment on self-reported overall health, the authors examined the cross-sectional and longitudinal impacts of job characteristics in mediating the relationship between one SES measure—education—and health. They found that job characteristics explain between 27-44 percent of the association between education and health. Therefore, they find that job characteristics are important in mediating the effect of education on health.

These findings are important because of the implications for public policy. As work characteristics play an important role in understanding the link between SES and health, public policy makers may find it prudent to seek for ways to better prepare lower-income individuals for better jobs, or provide incentives to employers to encourage them to make workplace changes, which ultimately may result in less ill health among lower-income individuals.

### **CRITIQUE OF EXISTING LITERATURE AND FUTURE DIRECTIONS**

As demonstrated in the review section of this paper, the literature on the workplace and health covers a number of areas, from classic psychosocial explanations for worker mental and physical health and health behaviors, to more specific findings on physical health related to repetitive strain injuries, to other findings that report differences in the impacts of various work characteristics by gender and sector. However, to understand the true implications of these

findings it is important to look closely at study methodologies, which brings me to the second main question of this paper: What are the prevailing methodological approaches in exploring the link between job characteristics and health? In what follows I will briefly provide some methodological critiques of the current body of research in trying to address this question.

### STRENGTHS OF CURRENT STUDIES

There are several strengths of the study designs and methodological approaches taken in the studies reviewed for this paper.

- **Longitudinal:** A few of the studies were able to utilize more of a longitudinal design, which enabled the researchers to make stronger claims as to the direction of causality in the work characteristics—health relationship. For example, Totterdell, Wood, and Wall (2006) utilized limited longitudinal data from study participants who completed a diary questionnaire every week for 26 weeks to study the Karasek job strain model.
- **Innovative Methodology:** Totterdell, Wood, and Wall's (2006) study also demonstrates the use of an innovative methodological approach to examining an old question. Prior to this research, most studies had utilized cross-sectional survey data. The innovative use of worker portfolios to record ongoing worker perceptions in changes to work environment provided rich and descriptive data.
- **Use of Mixed Methods:** Several of the studies examined here used a mixed methods approach to study design, enabling the researchers, in part, to overcome some of the other limitations to their studies.

### WEAKNESSES/LIMITATIONS OF CURRENT STUDIES

In addition to the strengths, there are also numerous limitations to the studies described in the review section of this paper, and thus the true implications of study findings must be carefully considered. All of the studies experienced at least one of the following common limitations:

- **Cross-sectional:** Nearly all of the studies used some cross-sectional data. In many cases, cross-sectional data is the only kind available to examine the researchers' question, but the use of cross-

sectional data limits the extent to which the researchers can make claims on the directionality of the causal relationship, as such data only allows for a single snapshot in time and doesn't allow for temporal ordering. Thus it is difficult to definitively say that certain work characteristics cause ill health or poor health behaviors. In fact, there could be a reverse relationship, where one's ill health or poor health behaviors predict the type of job an individual will take.

- **Self-report Measures:** Nearly all of the studies used at least some self-report variables in the final analysis. Though a case could certainly be made for using self-perceived measures when analyzing the impact of relative job characteristics on health, and in many cases it may be difficult to study such phenomena in any other way, the use of such measures also allows for cultural biases to find their way into the data and may confound the findings.
- **Non-Random Sampling Procedures and Generalizability:** Several of the studies used non-random sampling procedures in creating the study sample. This results in some strata of society not being represented in the sample, and findings that can not be easily replicated, nor would be appropriate to generalize such findings.

Therefore, until more rigorous studies, capable of eliminating or reducing the impact of these common limitations, are conducted and findings reported, we must take the findings of these studies with a grain of salt and not be too quick to generalize findings of specific work characteristics, in specific setting, at a specific time, to other cases.

### FUTURE DIRECTIONS

I am encouraged by the number of intriguing findings that have emerged from the literature on work characteristics and worker health. There are numerous studies that find clear linkages between important psychosocial work characteristics and health. However, despite the increase in the popularity of microfinance programs and the vast amount of research conducted to date, there are two key areas for future research into the relationship between job characteristics and worker health.

First and foremost, more rigorous studies are needed. Specifically, there is a need for more longitudinal studies that can better help clearly define the direction of causality in the work characteristics—health relationship. Furthermore, studies need to utilize random sampling procedures that will represent of all strata of society, while allowing for generalizable findings. Finally, whenever possible, objective work characteristic and health measures should be obtained to compliment the many self-report measures that are currently utilized in this research.

In addition to the needs for more rigorous studies, the review of the current literature has revealed several specific aspects of the work characteristics—health relationship that I think should be further explored. First, given the conflicting findings reported here, there is a need for more research into possible gender differences in the impact various work characteristics have on worker health. Second, Jamison, Wallace, and Jamison (2004) reported private/public sector differences in the impact certain work characteristics have on health, without providing any clear or thorough explanations as to why this is the case. Therefore, more research into private/public sector differences may help to shed some light on this issue. Third, Tsutsumi, et al. (2003) briefly mentioned possible differences between job characteristics of preindustrial and postindustrial occupations. Given the changing nature of work in recent decades, I believe this warrants further analysis. Finally, as we live in a global economy with transnational corporations and increasing diversity in the workplace, I believe that more work should be done in comparing the impact of various job characteristics on health across countries and cultures. Further research into each of these areas, while utilizing rigorous study designs, will help to clarify some of the foggy areas in the field and provide additional insights that may aid work organizations and public policy makers in creating worker health-friendly work environments.

### **POLICY IMPLICATION AND PRESCRIPTIONS**

The review of other research findings and the evaluation of their study designs now lead me to my final research question: What are the policy implications of the findings in the existing research? The studies reviewed for this paper have identified several key findings in the relationship between workplace characteristics and health. First, there is clear empirical evidence to support job demands, decision latitude, and social support as key indicators in workers' physical and psychological health, as well as health behaviors. Furthermore, though some debate remains, there

seems to be a difference between women and male workers in the experience of ill health as a result of workplace characteristics, as well as differences between workers in the private and public sectors. Finally, clear empirical evidence has demonstrated the important mediating effect that work characteristics plays in the SES-health relationship.

These findings suggest several possible areas for policy interventions on the part of employers, families, and public policy makers, to help increase worker health, as well as reduce potentially hazardous workplace conditions that could result in poor worker health.

First, organizational characteristics play a huge role in the workplace-health relationship. Firms need to recognize the cost that ill health has on the bottom line and put in place work reorganization policies that might reduce the structural physical and psychological demands that a particular job or job type may have on workers. One possible intervention would be for firms to seek ways to flatten the hierarchal organizational structure and more often utilize alternative work forms such as self-managed work teams, where everyone shares in responsibility, decision making, and workload.

Second, firms and individual employees should seek for ways to increase opportunities to find social support both in the workplace and outside of the workplace, which may help to soften the negative impact of high demand and low control aspects of one's work. Firms can more effectively utilize mentoring programs and other employee support programs, while maintaining family-friendly policies that would allow for the employees to spend sufficient time with family and friends outside of the workplace.

Finally, firms should implement ergonomic measures and implement organizational policies to help reduce repetitive strain injuries among workers. This can be accomplished as workstations are evaluated and redesigned to better meet the physical needs of workers. Furthermore, to help facilitate this evaluation and redesign process, individual workers should propose ideas for improvement to management, who should be open to exploring the implementation of such proposals.

Though the majority of the responsibility for changes in organizational policy and work design lies with employers, public policy makers also play an important role. Policy makers should seek for ways to provide incentives to private employers to institute such changes through demand-side tax

code incentives provided to employers whose workplace meets certain standards. Furthermore, as mentioned briefly before, public policy makers may find it prudent to seek for ways to better prepare lower-income individuals for better jobs, which ultimately may result in less ill health among lower-income individuals.

### **CONCLUSION**

In conclusion, work is a very important part of one's everyday life, but the nature of work has been changing in recent decades. Therefore, it is important to understand the workplace characteristics that impact our lives, particularly in terms of health. There is clear empirical evidence in the literature that shows that one's job demands, decision latitude, and social support are key indicators in a worker's physical and psychological health, as well as health behaviors. Additionally, there seems to be a difference between women and male workers in the experience of ill health as a result of workplace characteristics, as well as differences between workers in the private and public sectors. Furthermore, clear empirical evidence has demonstrated the important mediating effect that work characteristics plays in the SES-health relationship. Though each of these findings comes from a body of literature with both strengths and weaknesses in study design and analysis, these findings suggest several possible areas for policy interventions on the part of employers, families, and public policy makers, to help increase worker health, as well as reduce potentially hazardous workplace conditions that could result in poor worker health. Future research must continue to examine the relationship between specific work characteristics and worker health, applying rigorous study designs to ensure the potential of replicability and generalizability of the study findings.

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