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Health Hazard Evaluation Report 93-004
Initial Finding and Recommendations Concerning
the Psychological Effects of the Working Conditions
of Package Truck Drivers at United Parcel Service

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Public Health Practice Service Institute
HEALTH HAZARD EVALUATION OF
THE PSYCHOLOGIC EFFECTS OF THE WORKING CONDITIONS
OF PACKAGE TRUCK DRIVER AT UNITED PARCEL SERVICE

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SUMMARY

Background: Occupational stress is a perceived imbalance between occupational demands and the individual's ability to perform when the consequences of failure are thought to be important. Mental disorders documented to be associated with "job stress" include anxiety, depression, and other mood disorders, maladaptive behavioral and life-style patterns, chemical dependencies, alcohol abuse, and sleep disorders. Stress, as well has been associated with gastrointestinal disease, exacerbation of respiratory disorders, increased blood pressure and cholesterol, and coronary artery disease. Workers in jobs with high psychological demands combined

with low work control have been shown to smoke more heavily than those in lower strain job categories.

Introduction: United Parcel Service Package Truck Drivers were reported to be working in conditions quite similar to those reported by Cahill at the US Postal Service and associated in the literature with the development of stress related disease. In December, 1992 the International Brotherhood of Teamsters, AFL-CIO contacted the Illinois Health Hazard Evaluation (HHE) Program of the University of Illinois Occupational Health and Safety Center to investigate occupational stress among Package Truck Drivers they represented at United Parcel Service (UPS). The participants for this study were UPS package truck drivers from UPS administrative centers within hubs in Saddlebrook, New Jersey; Oshkosh, Wisconsin; Houston, Texas; and Concord, California. The study instruments were validated in the general population and norms for comparison have been established. Participants completed a survey package which consisted of six self-administered questionnaires, The Symptom Checklist 90-R (SCL90-R), The daily Stress Inventory (DSI), The Occupational Stress Inventory (OSI), The F and K scales from the MMPI-2, The Shipley Institute of Living Vocabulary Test, and a demographic questionnaire.

Results: A total of 388 drivers were eligible for the study and 317 drivers participated from all center combine, representing 82%. Fourteen individuals produced questionnaires with F scales above 16 indicating marked over reporting of symptoms and were eliminated from the analysis. Of the total test takers, 94.7% were males, 5.3 % females, the ages of the participants ranged from 24 to 60 with a mean age of 35 years old. The length of employment with UPS ranged from less than 1 year to 31 years, with a mean of 9.6 years. 35% completed only high school, 46.6% finished some college, and 16.8% were college graduates. 71.9% were married, 18.5% were single, and 9.6% were divorced or widowed. A total of 254 (84.7%) reported that they experience physical pain as a direct result of the job. The back was the most common site of pain, pain in the leg of foot was next, and pain in the arm or hand followed in frequency. The back was also the most common site of job-related injury with 27.5% participants reporting a back injury.

The Package Truck Drivers scored significantly above the norm on all summary and individual scales derived from the SCL90-R indicating a substantial increase in psychological distress for this group. The Global Severity Index, the best single summary measure of psychological distress in the SCL 90-R, revealed a mean T score for the drivers of 64.20 placing them in the 91st percentile. These workers, therefore, have stress related symptomatology that place them in the top 9 percent of the general population for psychological distress. The group responses to daily stressors ratio value was significantly though mildly elevated at 51.84 or the 54th percentile of the normative population. The perceived stressor frequency (event value), or the number of stressful events in the last 24 hours, was elevated slightly more at 55.79 representing the 69th percentile. Finally, the sensitivity to the events (impact value) was also increased by a similar proportion at 55.18.

The driver means were also significantly elevated on all 4 of the OSI strain scales, most substantially for physical strain and vocational strain. With the exception of Responsibility, the OSI scales for work characteristics known to be associated with stress were all significantly elevated for these Package Truck Drivers. Role Overload was the most consistent factor associated with the above symptoms of psychological distress and strain on regression analysis. Reported exposure heat, cold, noise, or other

environmental stressors, was reported at 82.47 (SD=14.32, P<0.0001,), which places them in the 99th percentile for this scale. UPS Package Truck Drivers scored slightly though significantly below the comparison mean for all 4 of the OSI coping mechanism scales.

CONCLUSIONS: Job stress is a significant health hazard for UPS Package Truck Drivers. These workers scored in the top 91% of the population on the Global Stress Index. These symptoms are consistent with the higher scores on the job strain scale and higher levels of physical and psychological stress reported by Dr. Janet Cahill in her 1990 survey of Postal Workers.

Job characteristics known to cause stress, and similar to those found at the UPS Service, are present in significantly greater frequency for UPS Package Truck Drivers than for the general working population.

The costs associated with this occupational hazard will be measured by decreases in the quality of life for the employees and their families as well as likely increased workers compensation and health insurance/disability costs to the employer and the society as a whole. Initial evaluation of UPS national workers compensation experience would indicate that the rates for its entire workforce are increasing yearly. From 12,305 lost time claims in 1990 (7.6% of workforce) to 14,280 claims (7.98%) in 1992. When Package Truck Drivers are looked at in isolation it would appear that for broken/crushed, cuts/bruises, and puncture/abrasions UPS rates are some 3 times those for workers in similar jobs in the U.S.

RECOMMENDATIONS: A corporate wide approach to the study and reduction of workplace stress for Package Truck Drivers is necessary at UPS. Renewed attention to this area should emphasize the correction of those aspects of this job which have been identified to cause psychological distress. Data should be collected by UPS to allow on going surveillance of the effects of the workplace on the workers health and quality of life.

INTRODUCTION

Stress is a dynamic condition consisting of a unique set of emotional, intellectual and physiological responses to a stimulus. This stimulus, or stressor as it is commonly called, can be a constraint, a demand, or even an opportunity which is perceived by an individual to have a potentially important, though uncertain outcome. (Robbins, 1991) Occupational stress is the sum of all factors in a work-place which elicit a stress response in an individual. It has been further defined as a perceived imbalance between occupational demands and the individuals ability to perform when the consequences of failure are thought to be important. (McLean, 1980)

It has long been suspected that persons experiencing high levels of stress develop a group of psychological and physical disorders. Recent research in this area has reinforced this perception and begun to identify the specific stressful situations that produce the effects.

Mental disorders documented to be associated with "job stress" include anxiety, depression, and other mood disorders, maladaptive behavioral and life-style patterns, chemical dependencies, alcohol abuse, and sleep disorders. (Sauter, 1990 and Cahill, 1990) Stress, as well, has been associated with hyperacidity and peptic ulcer formation as well as other pathological gastrointestinal conditions. (Holtmann, et. al., 1990, Peters and Richardson, 1983) Exacerbation of respiratory disorders, most prominently

asthma, have long been associated with stress. A relationship recently confirmed by laboratory evaluation. (Kotes, et. al., 1989)

High psychological job demands combined with low work control has recently been shown by researchers to affect smoking habits. Specifically, they found that individuals in higher strain jobs smoked more heavily than those in lower strain job categories. (Green, 1990) The detrimental effects of increasing cigarette intake are of course well known and include lung and heart disease as well as cancer.

In a job category similar to UPS Package Truck Drivers, a recent study of mail handlers employed by the US postal service by Dr. Janet Cahill in 1990 was based on a sample of 4,018 survey questionnaires returned from a mailing of 11,000. Dr. Cahill reported that these employees suffered higher levels of psychological job demands, lower levels of supervisory support, higher level of sleeping problems. She also noted that Vietnam veterans reported especially high levels of stress related symptoms.

UPS Package Truck Drivers were reported to be working in conditions quite similar to those previously associated with the development of stress related diseases. They were reported to be suffering a variety of symptoms and diseases quite possibly related to stress, as well as experiencing a "burn out" phenomena after a period of years on the job.

The drivers reported that there existed a punitive rather than collaborative approach by front line supervisors. There was daily supervisory pressure for increased productivity through longer days, working through lunch, stressful supervisory presence in the truck on the routes, and pressure on replacement workers to outperform those on sick leave or vacation. They complained about conflicting expectations emanating from differing supervisors, and a disciplinary system in which, even for minor infractions, they were "judged guilty, and sentenced, before trial" and before arbitration of their grievance. Finally, they reported a stressful social environment at work fostered by a lack of social support from supervisory personnel.

This study was undertaken to assess whether UPS Package Truck Drivers were experiencing more stress related psychological symptoms than would be expected in the general population and whether specific work characteristics could be identified as potential stressors.

BACKGROUND

In December, 1992 the International Brotherhood of Teamsters, AFL-CIO contracted the Illinois Health Hazard Evaluation (HHE) Program to investigate occupational stress among Package Truck Drivers they represented at UPS. The HHE Program is a collaborative program of the Illinois Occupational Health and Safety Center. Its mission is to provide an impartial scientific evaluation of unique health hazards in industry or the community.

The program's policy is to report on its evaluations publicly without information that might identify individual participants. Specifically, it feels an obligation to report the findings to those individuals studied in an understandable format and to be available for further explanations if necessary. The right of publication of these reports resides with the University researchers and is not subject to negotiations with the funding source.

To conduct this study, a team of health professionals from the University of Illinois and Rush Presbyterian Saint Lukes Medical Center was assembled consisting of occupational medicine physicians, a psychologist, a biostatistician, and several research assistants. An outside review committee was also assembled, consisting of three nationally recognized experts in the field of occupational medicine and stress, to review and comment on methodological issues, interpretations of results, etc.

OBJECTIVES

The primary objectives of this investigation were 1) to determine the prevalence of psychological distress symptoms among a sample of UPS Package Truck Drivers as compared to the US population, and 2) to determine what job characteristics known to produce stress reactions among the employees exist in this work setting.

MATERIALS AND METHODS

Study Population

The participants for this study were UPS package truck driver from UPS administrative centers within hubs in Saddlebrook, New Jersey; Oshkosh, Wisconsin; Houston, Texas; and Concord, California. These sites were selected in consultation with representatives from the International Brotherhood of Teamsters to reflect the national UPS package truck driver population and for logistical reasons. Drivers were recruited into the study by local Union officials through announcements, flyers and/or letters, individual telephone calls, and in-person reminders on the day the survey was administered. They were informed that the purpose of the project was to assess the health effects of their work. Participants were assured of the confidentiality of their responses; neither management nor the union would have access to information which allowed the identification of individuals, and that all data would be held at the University of Illinois.

Control Population

The study instruments are validated in the general population and norms for comparison are established.

Testing Procedure

In New Jersey, Wisconsin and Texas the survey was administered after work shift at a conveniently located hotel conference room. For those drivers unable to attend the evening session, another survey administration session was held the following morning before the work shift. In California the survey was administered one time only on a Saturday at the Union Hall. At all sites the survey was distributed by researchers from the HHE study team who remained present throughout the session to distribute and collect the survey questionnaires, field problems and questions.

Survey Instruments

Participants completed a survey package which consisted of six self-administered questionnaires:

1. SYMPTOM CHECKLIST 90-R:

The Symptom Checklist 90-R (Derogatis, L.R., National Computer Systems, Minneapolis, MN, 1975) is a 90 item symptom questionnaire which reflects problems of psychological and psychosomatic origin. Subject responses are scored with regard to nine symptom constellations: somatization, obsessive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism. Three indices of perceived distress are also scored: a global severity index, positive symptom total. The test is designed to detect psychiatric symptomatology in apparently normal people.

2. THE DAILY STRESS INVENTORY:

The Daily Stress Inventory (Brantley, P.J., Psychological Assessment Resources, Odessa, FL, 1989) is an assessment of the individual's ability to cope with normal daily events. The DSI yields three measures of reaction to daily stresses: perceived stress frequency, reaction to these events in aggregate, and an average event reaction.

3. OCCUPATIONAL STRESS INVENTORY:

The Occupational Stress Inventory (Osipow, S.H., and Spokane, A.R. Psychological Assessment Resources, Inc. Odessa, FL, 1988,9) surveys three domains of occupational adjustment: factors causing occupational stress, resultant psychological strain and coping resources. It assesses occupational stressors including physical environment, responsibility, role ambiguity, role boundary, role insufficiency, and role overload. Its scales identifying the effects of these stressors include: interpersonal strain, physical strain, psychological strain, and vocational strain. Coping resources include rational/cognitive, recreation, self-care, and social supports.

4. THE F AND K SCALES:

In order to assess the validity of the responses, the F Scale from the MMPI-2 was used as an index of exaggerated negative self presentation. The K Scale also from the MMPI-2, was used to identify whether the responders were defensive about revealing symptoms.

5. VOCABULARY:

The Shipley Institute of Living vocabulary test was administered to control for the effect of education and lack of facility with English on the results.

6. DEMOGRAPHIC:

A check list questionnaire was included to record demographic information on the responders. Length of employment for UPS, age, sex, racial/ethnic background, years of schooling, number of packages delivered on an average day, number of miles covered on an average day, living environment (alone, with family, etc.), psychoactive medication/alcohol use, marital status, injuries on the job, physical pain on the job, and loyalty to Union/Management were all questioned.

RESULTS

Participation Rate

According to UPS seniority, scheduling, or currency envelope lists provided

by the local union officials at each site, a total of 438 UPS package drivers were eligible for participation in this study. After elimination drivers that could not be contacted or were unable to attend the session because of physical disability, non package truck driver assignment, or pre-arranged plans to travel out of town, 388 drivers were eligible for participation. Three hundred and seventeen drivers participated from all centers combined, representing 82% of those eligible. The center specific rates varied from 69% in Houston to 90% in Oshkosh.

Invalid Questionnaires

Fourteen individuals produced questionnaires with F scales above 16 indicating marked over reporting of symptoms. These were eliminated from further analysis except to determine that they did not fall within any demographic category. This left 303 valid responders.

The Daily Stress Inventory posed a different problem due to an apparent misunderstanding of the directions in the first two center in Oshkosh and Concord. The directions stated to rank the stress level experience if a listed situation had occurred to the individual in the 24 hours prior to taking the test, 92 subjects answered all 58 items, suggesting that the subject understood the instructions to mean if the situation occurred what would his or her response be. Since this is not what the survey is designed to measure, all questionnaires for which every item was ranked were eliminated from the analysis leaving 211 survey responses for DSI interpretation.

The Occupational Stress Inventory had some questions that were not answered. Rather than add a mid level response for each unanswered question the sub-scale that contained the unanswered question was eliminated from analysis. The responses ranged from a low of 287 on the Interpersonal Strain scale to 300 on the Role Insufficiency, Psychologic Strain, and Responsibility scale.

Data Analysis

The F Scale means was 5.59 including those individuals scoring above 16. This value is well within the normal range which covers all responses below 7. With the removal of the 14 marked over responders, the mean for the F scale was 5.01 with a standard deviation of 3.39.

The K scale response yielded a mean raw score of 14.09 with a 5.54 standard deviation. This correlates to a T value of 47 within the normal range of 46 to 55.

The number of correct responses on the Shipley Institute of Living Vocabulary test ranged from 7 to 39 out of a total 40 possible correct responses. The mean number of correct responses was 30 with a standard deviation of 5.3.

Psychological parameters are reported as T value of the mean of this study group compared with a t value of 50 and a standard deviation of 10 based on the norms established for the general population. Therefore, mean scores for this test group of 60 correlate with the 84th %, and 70 with the 98th % of the general population. Only those scores that are statistically significant with a P value of 0.05 or less are reported in this analysis. These differences between the study group means and those of the general population are likely to have occurred by chance less than 1 time in 20.

Demographics

The total sample consisted of 303 test takers. Percentages are calculated based on the total number responding to the specific question. 285 (94.7%) were males, 16 (5.3%) females with 2 missing. The ages of the participants ranged from 24 to 60 with a mean age of 35 years and a standard deviation of 7.0. The racial composition of the sample consisted of 248 (83.5%) whites, 30 (10.1%) blacks, 11 (3.7%) hispanics, 5 (1.7%) American Indians and 3 (1.1%) Asian-Americans. There were some statistically significant differences in this racial distribution between sites. The majority of the black participants were from Texas (63.3%) followed by New Jersey (33.3%). The majority of the hispanic participants were from New Jersey (54.6%) followed by California (36.4%).

The length of employment with UPS ranged from less than 1 year to 31 years, with a mean of 9.6 years and a standard deviation of 6.9. The number of packages reportedly delivered per shift ranged from 100 to 1500, with a mean of 428.5 per shift and a standard deviation of 215.6. The number of miles reportedly driven per shift ranged from 7 to 250 with a mean of 71.3 miles per shift and a standard deviation of 43.2.

106 (35%) participants completed high school while another 141 (46.6%) had finished some college and 51 (16.8%) were college graduates. The remainder had either not finished high school (3) (1%) or had some post-college education (2) (0.7%).

The majority of participants in the study, 217 (71.9%), were married. Fifty-six (18.5%) were single, 28 (9.3%) were divorced and 1 (0.3%) was widowed. There were some statistically significant differences in the marital status distribution between sites. In New Jersey 26.7% of participants were single with only 3.4% divorced while in Texas only 9.1% were single but 18.2% were divorced.

Living with spouse or other family members was the arrangement chosen by 247 (81.5%) of participants. Thirty-two (10.6%) live alone and 24 (7.9%) live with non-related partners. This distribution was also statistically significantly different between sites. Only 1 (0.9%) individual lives with a non-related partner in New Jersey whereas 6 (12.5%) in California and 7 (12.7%) in Texas live with non-related partners.

The largest number of respondents, 113 (37.3%), have no children. Sixty-nine (22.8%) have 1 child, and 80 (26.4%) have 2 children. The remaining 41 (13.2%) have 3 or more children. Of the total sample, 174 (58.2%) reported no difficulties with child care arrangements in the past month. Thirty (10.0%) did report difficulties with child care. For 95 (31.8%) respondents, the question was not applicable.

Regarding medication usage, only 3 (1.0%) participants reported using medications for their nerves, 18 (6.0%) use medications to help them relax, and 9 (3.0%) use medications to help them sleep. On the other hand, 273 (90.4%) of the total sample do report using medications for conditions other than those listed above. 29 (9.6%) reportedly use no medications at all.

The majority of participants reported that they consume no alcoholic beverages on a daily basis. 106 (35.4%) drink between 1 and 3 alcoholic drinks per day, and 9 (3.0%) drink 4 or more alcoholic drinks per day.

A total of 254 (84.7%) of those surveyed reported that they experience physical pain as a direct result of the job. Only 46 (15.3%) reportedly do not. This response pattern showed statistically significant variation between sites; in California 91.7% of all participants reported experiencing physical pain as a direct result of the job, whereas in Texas only 71.7% did.

The back was the most common site of pain; 221 (73.2%) participants reported experiencing pain in the back, while only 81 (26.8%) reportedly do not experience such pain. Pain in the leg or foot was experienced by 138 (45.7%) of all respondents; in the arm or hand was reported by 103 (34.1%) respondents. This finding varied with statistical significance between sites; in California 45.8% of the sample reported experiencing pain in the arm or hand, while in Texas only 20% reported similarly. Pain at other unspecified sites was reported by 37 (12.3%) while 365 (87.7%) reported no other pain.

The back was also the most common sites on job-related injury with 83 (27.5%) participants reporting a back injury. This distribution also showed statistically significant variation between sites; in California 47.9% of those surveyed reported having had a back injury on the job whereas only 14.6% of those in Texas reported similarly. A job related injury to the leg or foot was reported by 62 (20.5%) respondents. 44 (14.6%) respondents reported that they had sustained an injury to the arm or hand while on the job. A job related injury to another unspecified part of the part body was reported by 23 (7.6%) participants.

Employer loyalty was rated as "average" by 125 (41.5%) of the total sample. Another 96 (31.9%) described "strong" loyalty to their employer, 43 (14.3%) had "very strong" employer loyalty, and 37 (12.3%) rated their employer loyalty as "weak". Loyalty to the Union was rated as "strong" by 115 (38.2%) individuals. 91 (30.2%) reported "average Union loyalty. "Very strong" Union loyalty was reported by 81 (26.9%) respondents, while 14 (4.7%) described themselves as having "weak" Union loyalty.

Psychological Symptoms

The T values for the Package Truck Drivers means on all summary and individual scales derived from the Symptom Checklist 90-R were significantly elevated indicating a substantial increase in psychologic distress for this group.

The Global Severity Index is the best single summary measure of psychological distress in the SCL 90-R by combining a measure of the number of symptoms and their severity. The 303 responders had a mean T score of 64.20 (SD=11.00, $P<0.0001$), placing them in the 91th %. These workers, therefore, have stress related symptomatology that places them in the top 9 percent of the general population for psychological distress. The Positive Symptom Distress scale of the SCL 90-R records the perceived stress from the reported symptoms. The T value was 58.48 (SD=8.43, $P<0.0001$) for this scale approximately in the 77th % of the US population and substantially above the comparison mean.

The T value for The Positive Symptom Total scale, a measure of total symptoms of psychological distress was 62.56 (SD=11.16, $P<0.0001$) again above the comparison mean and in the 88th %.

The T means of Package Truck Drivers on all sub-scales of the SCL 90-R were

substantially and significantly above the comparison mean as well. Somatization, reflection distress arising from perceptions of bodily dysfunction, was 64.77 (SD=9.74, $P<0.0001$, 91st %). Obsessive-compulsive symptoms were 61.38 (SD=10.96, $P<0.0001$, 85th %). Interpersonal sensitivity, an index of feelings of personal inadequacy and inferiority, was 61.56 (SD=10.72, $P<0.0001$, 86th %). Depression was 62.42 (SD=10.72, $P<0.0001$, 87th %) Anxiety was 60.96 (SD=11.36, $P<0.0001$, 84th %). Hostility was 61.68 (SD=11.20, $P<0.0001$, 86th %). Phobic anxiety, a persistent fear response which is irrational and disproportionate to the stimulus, was less though still significantly elevated at 54.67 (SD=9.53, $P<0.0001$, 66th %). The T value for paranoid ideas was 62.48 (SD=11.01, $P<0.0001$, 87th %). Lastly, psychoticism, providing a scale in which elevations represent a range from mild interpersonal alienation to frank psychosis, was 60.28 (SD=11.23, $P<0.0001$, 82nd %).

The Daily Stress Inventory scales scores were based on 211 responders. The group mean t score for reaction to daily stressors (ration value) was significantly though mildly elevated at 51.84 (SD=10.20, $P<0.0095$, 54th %). The perceived stressors frequency (event value), or the number of stressful events in the last 24 hours, was elevated slightly more at 55.79 (SD=9.73, $P<0.0001$, 69th %) Finally, the sensitivity to the events (impact value) was also increased by a similar proportion at 55.18 (SD=9.27, $P<0.0001$, 67th%).

The group's T score means were also elevated on all 4 of the Occupational Stress Inventory strain scales. Interpersonal Strain, indication difficulty with relationships, had a mildly elevated T score of 54.61 (SD=10.47, $P<0.0001$, 78th %). Psychological Strain, measuring feelings of anxiety or depression, was found to be slightly elevated at 54.98 (SD=10.97, $P<0.0001$, 66th %). Finally, Vocational Strain, indication work related dissatisfaction and anxiety, was substantially elevated at 60.47 (SD=13.21, $P<0.0001$, 83rd %).

With the exception of Responsibility, the Occupational Stress Inventory scales for work characteristics known to be associated with stress were all significantly elevated for these Package Truck Drivers. Role Overload, the most consistent factor associated with the above symptoms of psychological distress and strain on initial regression analysis, was found to have a mean T score of 54.90 (SD=8.35, $P<0.0001$, 66th %). Role Insufficiency, indication career dissatisfaction and poor prospects, was 60.02 (SD= 9.96, $P<0.0001$, 82nd %). Role Ambiguity, indication a poor sense of job requirements and the standards by which their performance will be judged, was 58.71 (SD=11.41, $P<0.0001$, 78th %). Role Boundary, indicating being caught between conflicting supervisory demands, was substantially elevated at 64.58 (SD=10.29, $P<0.0001$, 91st %). Lastly, Package Truck Drivers reported a Physical Environment indicating exposure to a perceived noxious environment (heat, cold, noise, etc), at a mean T value of 82.47 (SD=14.32, $P<0.0001$), which places them in the 99th % for this scale.

The Occupational Stress Inventory's scale for responsibility for the well being of others on the well being of others on the job was significantly below the comparison mean of 50, at 43.25 (SD=14.32, $P<0.0001$, 20th %). This is consistent with the individual work setting and lack of supervisory responsibilities of these employees.

Finally, the Occupational Stress Inventory has 4 scales to assess an individual's personal and social resources to cope with stress. UPS Package Truck Drivers scored significantly below the comparison mean for all 4 of

these scales. The Recreation scale measures the ability of the individual to find relaxing and satisfying activities during their free time. The study group's mean T value was 48.26 (SD=11.01, P<0.0071, 41st %), slightly below the comparison mean of 50. Attention to Self Care in this group was still farther below the mean at 46.06 (SD=10.41, P<0.0001, 33rd %). Social Support for this group, including supportive family, friends, and importantly coworkers and supervisors, was found to be 47.18 (SD=10.83, P<0.0001, 36th %). The Rational/Cognitive scale measures the ability of the individual to organize and prioritized tasks including their ability to examine and organize their work. In addition, this scale assesses the individuals ability to put their jobs out of their minds when they leave work. The mean T value for the Package Truck Drivers on this scale was also mildly but significantly below the norm at 45.07 (SD=11.31, P<0.0001, 29th %).

Regression analysis to understand more about the contribution of each of these work-place and demographic factors on the psychological distress and strain felt by these employees has not yet been completed.

DISCUSSION OF POTENTIAL BIAS

This, as any study based upon symptomatology and questionnaire responses, which is sponsored by an interested part, eg. union or management, is subject to biases and pressures to produce an outcome favorable to that sponsoring body. The following measures were taken in this study to prevent this type of positive bias:

1. All data was collected and kept confidential by researchers at the University of Illinois.
2. Full freedom of publication was established before the project began with the Union.
3. The questionnaires were distributed at the time of the test only and under the control of the researchers.
4. The survey instrument questionnaires were far too complicated to allow for advanced provision of the "correct" answers.
5. The high participation rate (82%) prevented a small disgruntled group from influencing the results in a major way.
6. Company records were reviewed and copies kept, assuring that the potential study population was accurately identified.
7. The data was treated conservatively by eliminating all F scale marked over responders.
8. The K scale indicated no significant under reporting.

CONCLUSIONS

1. Job stress is a significant health hazard for United Parcel Service Package Truck Drivers.

Each psychological symptom scale of the SCL 90-R, the Occupational Stress Inventory, and the Daily Stress Inventory indicated a consistent significant and substantial elevation of stress related symptoms over what is expected in the general adult population. In fact on the best single scale of psychological distress, the Global Stress Index from the SCL 90-R, the Package Truck Drivers scored in the 91st % percentile placing them amongst the most stressed adults in the United States. Only 8 percent of the population scores higher on this scale than these drivers.

These symptoms are consistent with the higher scores on the job strain scale

and higher levels of physical and psychological stress reported by Dr. Janet Cahill in her 1990 survey of Postal Workers.

2. Job characteristics known to cause stress are present in significantly greater frequency for United Parcel Service Package Truck Drivers than for the general working population.

The study group reported higher levels of Role Overload, Role Insufficiency, Role Ambiguity, Role Boundary Problems and Noxious Physical Environments than would be expected when compared to the general working population. Based on an initial review of multiple regression modeling of our results Role Overload is the job characteristic most consistently and directly related to worker stress levels.

This again is consistent with the findings of Dr. Cahill. She reported higher levels of psychological job demands, lower levels of decision authority or autonomy, and lower levels of supervisory support for the 4,018 mail handlers who responded to her survey.

3. There is a broader impact of the stress of this job. As would be expected, these occupational stressors affect Package Truck Drivers, their families, and friends during off hours as well.

The consistent elevations of the Daily Stress Inventory scales and the below the norm results for the Rational/Cognitive scale of the Occupational Stress Inventory indicate that these work stresses affect the responses of these employees to activities of daily living. Several of the SCL 90-R scales, and the Psychological and Interpersonal Strain scales of the OSI instrument indicate the global effects of this stress on the personality and behavior of these employees.

4. As is documented in the current literature on stress, the existence of this chronic stress originating at work will most likely cause an increase in the incidence of chronic mental and physical disease amongst Package Truck Drivers.

5. The costs associated with this occupational hazard will be measured by decreases in the quality of life for the employees and their families as well as likely increased workers compensation and health insurance/disability costs to the employer and the society as a whole.

Though collection of data concerning these effects is difficult, initial evaluation of United Parcel Service national workers compensation experience would indicate that the rates for its entire workforce are increasing yearly. In 1990 there were 12,305 lost time claims for a workforce of 173,879 for a rate of 7.68%. In 1991 this rate went up to 7.90% based on 13,905 claims for 175,902 employees. By 1992 this rate climbed still higher to 7.97% with 14,280 claims and 179,122 employees. These data do not correct for the 54% part time employees in 1990 and 1991 and the 55% part timers in 1992.

When Package Truck Drivers are looked at in isolation it would appear, based on initial data predicated on several adjustments and assumptions, that certain types of injuries, broken/crushed, cuts/bruises and puncture/abrasions, are some 3 times more common than would be expected based on comparison with data on worker in similar jobs contained in The US Department of Labor's Bureau of Labor Statistics files. While this

comparison is not without approximations and lacks the rigor necessary for firm conclusions, it is certainly suggestive of a continuing problem and may reflect the effects of the above identified workplace stress amongst other causes.

RECOMMENDATIONS

Based on the National Institute For Occupational Safety and Health's 1990 general recommendations (Sauter, 1990), the initial results of this study, and discussions with the employees themselves.

1. A corporate wide approach to the study and reduction of workplace stress for Package Truck Drivers is necessary at United Parcel Service.
2. Renewed attention to this vital area should emphasize the correction of those aspects of this job which have been identified in the literature, by NIOSH, and in this study cause work-related psychological distress.
3. The need for increased study of this area of workplace stress at UPS is apparent. Data should be collected to provide a base for rational decisions and on going surveillance.
4. A system should be devised to enable the use of health, disability, and workers compensation data in the on going surveillance of the effects of the workplace on the worker health and quality of life.

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