

# Stress and Health: An Empirical Study Based on Survey Data from 115 Chinese Truck Drivers

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**Abstract.** This study aims to investigate the correlation of stressors with health behaviors and health effects in the group of Chinese truck drivers. This study was cross-sectional in structure, and descriptive statistics and cross-tabulation were performed on a total of 115 first-hand questionnaires collected. The sample indicates that drivers are mainly male (97.4%) and 22.6% are aged 31 to 40. A significant finding in this study is that the drivers of this sample indicate a high level of income dissatisfaction, while at the same time being subjected to tremendous operating pressure and reporting a great prevalence of physical ill health. This study employed exploratory cross-tabulation analysis and determined that there is a positive association of bad health habits (irregularity of diet, etc.) with digestive diseases, association of psychological stress (longstanding anxiety, etc.) with cardiovascular disease, and a clear association of higher income dissatisfaction with a higher reporting of anxiousness. The conclusion drawn is that under conditions of pronounced income dissatisfaction and operational stress, the work characteristics of the freight industry, bad health habits, and psychological stress are interrelated and impose tremendous physical hardships on the drivers.

**Keywords:** Truck Drivers; Occupational Stress; Physical Health; Cross-sectional Study; Health Behaviors.

## 1. Introduction

Truck drivers are the "arteries" of the modern economy, supporting the efficient circulation of society's goods. However, this group has long endured high-intensity work pressure, and their health crisis is increasingly severe [1, 2]. China's truck driver group is particularly special; the health problems they face are extremely prevalent, and musculoskeletal disorders (MSDs), chronic gastritis, and hypertension have become high-incidence diseases [3].

Previous research, when exploring their causes, has mostly focused on work stress models (e.g., "Effort-Reward Imbalance" [4]) or work characteristics (e.g., "sedentary" [5]) and their direct impact on health. Although the negative impact of stress on health is already a consensus [6], its internal transmission mechanism is still unclear. Specifically, how exactly is stress (e.g., operational pressure) "transformed" into somatic diseases (e.g., stomach disease or cardiovascular disease)?

More importantly, research on Chinese truck drivers has a potential contradiction: on one hand, the operational pressure of this occupation is immense, leading to poor health status [7]; on the other hand, the relative economic income of this occupation (compared to other blue-collar jobs) may be relatively high, leading practitioners to hold a "satisfied" attitude towards income [8]. This "satisfied but sick" phenomenon in public discourse makes the research entry point complicated.

Therefore, the core question of this study is: Beyond economic pressure, what verifiable factors (e.g., health behaviors, psychological status) are linked to these prevalent health consequences? This study aims to use 115 first-hand survey data to exploratorily analyze the association pathways between stressors, health behaviors (diet), psychological status (anxiety), and physical health (MSDs, stomach disease, cardiovascular diseases).

The structure of this paper is as follows: The second part introduces the research methodology, including sample, measurement tools, and data analysis strategy; the third part presents the results of descriptive statistics and exploratory association analysis; the fourth part discusses the research findings and their implications; and the final part is the conclusion.

## 2. Methodology

### 2.1. Sample and Data Collection

This study used a cross-sectional survey design; data was sourced from a questionnaire containing N=115 respondents. As shown in Table 1, the vast majority of respondents were male (97.4%, N=112). 85.2% were "individual order-taking" drivers. In terms of work intensity, 47% (N=54) of drivers had an average daily driving time exceeding 10 hours ("average daily driving").

**Table 1.** Sample Demographics and Work Characteristics (N=115).

| Variable                                  | N                 | % or Mean (SD) |
|-------------------------------------------|-------------------|----------------|
| <b>Gender</b>                             | Male              | 112            |
|                                           | Female            | 3              |
| <b>Age</b>                                | 30 and below      | 9              |
|                                           | 31-40             | 26             |
|                                           | 41-50             | 66             |
|                                           | 51 and above      | 14             |
| <b>Experience</b>                         | 3 years and below | 3              |
|                                           | 4-6 years         | 9              |
|                                           | 7-10 years        | 15             |
|                                           | 11-15 years       | 18             |
|                                           | 16-20 years       | 18             |
|                                           | Over 20 years     | 52             |
| <b>Employment</b>                         | Self-employed     | 98             |
|                                           | Employed          | 17             |
| <b>Daily Hours</b>                        | <8h               | 39             |
|                                           | 8-10h             | 22             |
|                                           | 10-12h            | 17             |
|                                           | >12h              | 37             |
| <b>Income Dissatisfaction</b>             |                   |                |
| (1= Very Satisfied, 5= Very Dissatisfied) |                   | 4.07 (1.09)    |

### 2.2. Measurement Tools

All variables in this study were derived from the actual questionnaire items of this survey (see Appendix), and their measurement methods are summarized in Table 2.

**Table 2. Research Variable Measurement.**

| Variable Category         | Variable Name                      | Questionnaire Item (Source)                                                                                                              | Measurement                                                                                                              |
|---------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Independent Variable (IV) | Economic Stressors                 | “The biggest operational pressure you have experienced in the last six months comes from:”                                               | Multiple choice. Includes "Freight Rate Decline", "Unstable Freight Source", "Cost Increase".                            |
| Independent Variable (IV) | Income Dissatisfaction             | “Are you satisfied with your current income?”                                                                                            | 5-point Likert Scale (1= Very Satisfied to 5= Very Dissatisfied, higher scores indicate greater income dissatisfaction). |
| Dependent Variable (DV)   | Musculoskeletal Disorders (MSDs)   | “Do you have the following occupational diseases?” (options include cervical spondylosis, lumbar disc herniation, frozen shoulder, etc.) | Binary variable (1= Yes). Selected "Cervical Spondylosis", "Lumbar Disc Herniation", or "Shoulder Periarthritis".        |
| Dependent Variable (DV)   | Gastrointestinal Diseases (Gastro) | “Do you have the following occupational diseases?” (same item as above)                                                                  | Binary variable (1= Yes). Selected "Gastritis".                                                                          |
| Dependent Variable (DV)   | Cardiovascular Diseases (Cardio)   | “Do you have the following occupational diseases?” (same item as above)                                                                  | Binary variable (1= Yes). Selected "Hypertension Symptoms".                                                              |
| Exploratory Variable      | Irregular Diet                     | “Is your daily diet regular?”                                                                                                            | Binary variable (1= Regular, 2= Irregular).                                                                              |
| Exploratory Variable      | Long-term Pressure / Anxiety       | “Are you under excessive long-term psychological pressure and experiencing symptoms such as insomnia and anxiety?”                       | Binary variable (1= Yes, 2= No).                                                                                         |

### 2.3. Data Analysis

This study's data analysis strategy is as follows: First, use descriptive statistics (frequency, percentage, mean, standard deviation) to present the full picture of the sample (see Table 1, Figures 1-3). Second, to test the core question of this study (i.e., the association of behavioral and psychological factors), this study adopted crosstabulation analysis. The prevalence rate percentage of specific health consequences (e.g., "stomach disease") under different groups (e.g., "regular diet" vs. "irregular") was calculated, and these differences are presented in the form of bar charts (Figures 4-6). In the analyses, the income item was treated as an indicator of income dissatisfaction, with higher scores reflecting greater dissatisfaction and income-related stress.

## 3. Results

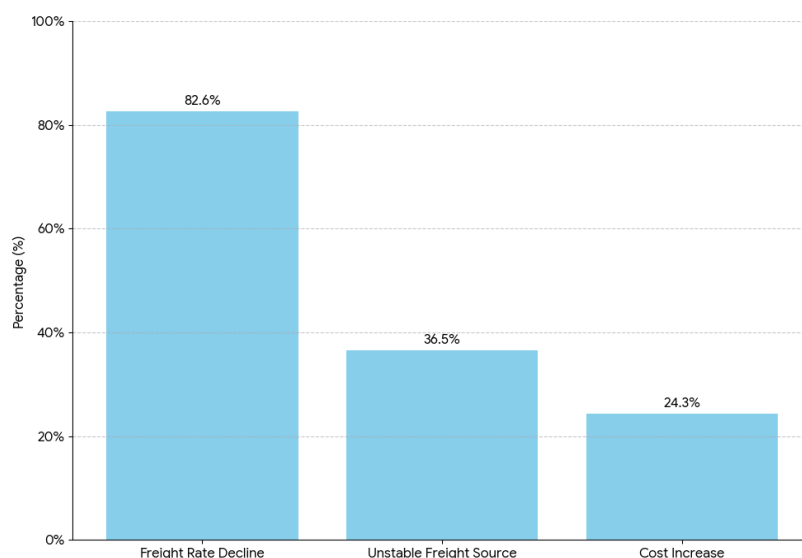
### 3.1. Sample Descriptive Statistics

This study's sample characteristics are detailed in Table 1 in Section 2.1. Among the 115 respondents, the sample presents distinct work characteristics: the vast majority are male (97.4%) and are mainly "individual order-taking" (Self-employed) model (85.2%). From a demographic perspective, this is an experienced, middle-aged group: 22.6% of respondents' ages are concentrated in 31-40 years, and 57.4% are concentrated in 41-50 years. In terms of driving experience, 45.2% of the drivers have over 20 years of driving experience, 31.3% have 11-20 years of driving experience. In terms of work intensity, the data confirms a high-intensity labor status, with 47% (N=54) of drivers having an average daily driving time exceeding 10 hours (including 10-12 hours and over 12 hours).

As mentioned in the foregoing introduction, a key characteristic of this sample is that, despite immense work pressure, the drivers' mean score on income dissatisfaction reached 4.07 (SD = 1.09) on a 1–5 scale (1 = very satisfied, 5 = very dissatisfied), indicating generally low-income satisfaction and high economic stress.

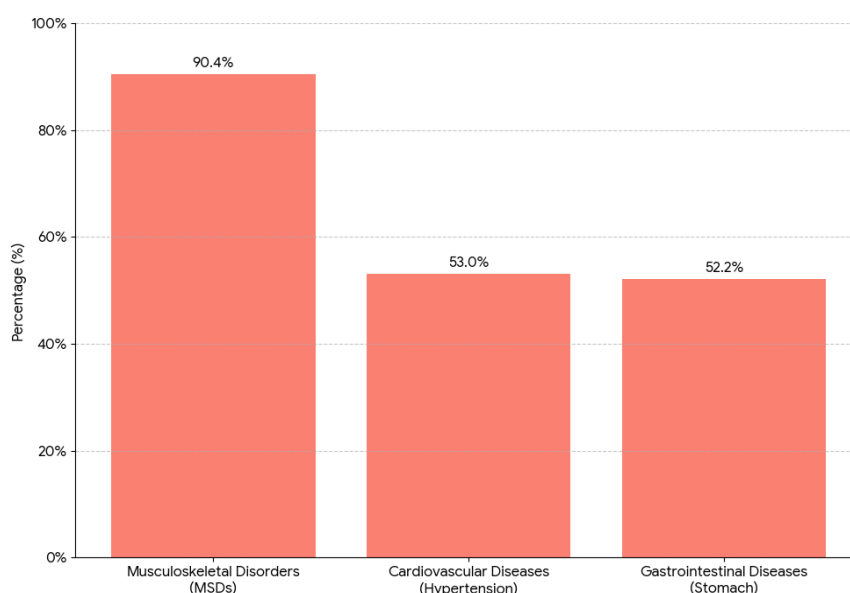
### 3.2. Description of Stressors, Health, and Psychological Status

This study conducted statistics on the core pressures, health consequences, and psychological status perceived by drivers. In terms of stressors, economic pressure is the primary pressure faced by the respondent drivers. As shown in Figure 1, "continuous decline in freight rates" (82.6%) was regarded by the vast majority of drivers as the biggest stressor, followed by "unstable freight sources" (36.5%) and "rising costs" (24.3%).



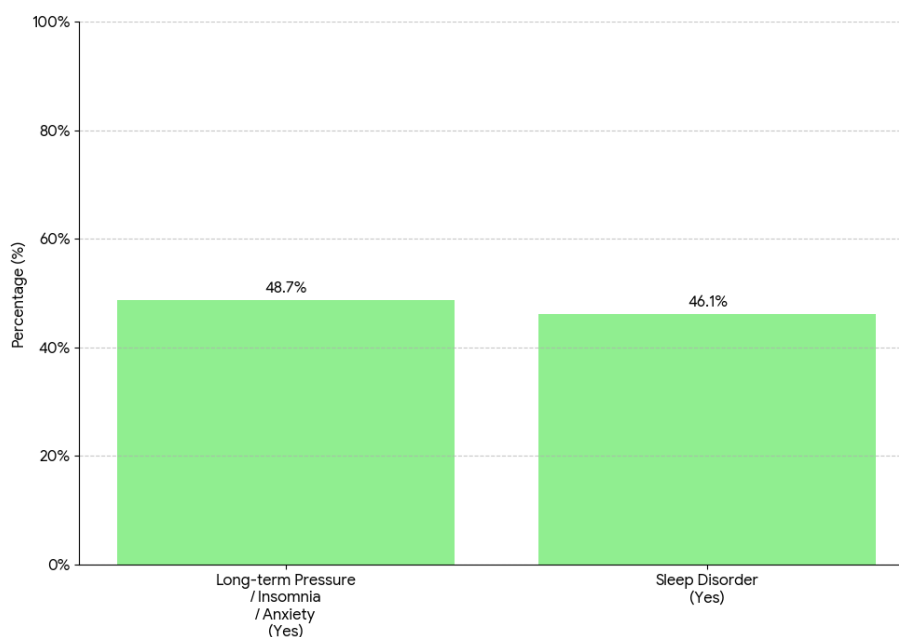
**Figure 1.** Main Stressors (N=115).

In terms of health consequences, as shown in Figure 2, health problems are extremely prevalent in this sample. MSDs (including cervical spine, lumbar muscle strain, frozen shoulder) have a prevalence rate as high as 90.4%. The prevalence rate of cardiovascular diseases (represented by "Three-Highs symptoms") is 53.0%. The prevalence rate of digestive system diseases (represented by "gastritis") also reached 52.2%.



**Figure 2.** Prevalence of Health Consequences (N=115).

In terms of psychological and sleep status, as shown in Figure 3, nearly half of the drivers reported "long-term pressure / insomnia / anxiety" (48.7%), and 46.1% of drivers reported having "sleep disorders" (sourced from the occupational disease list).

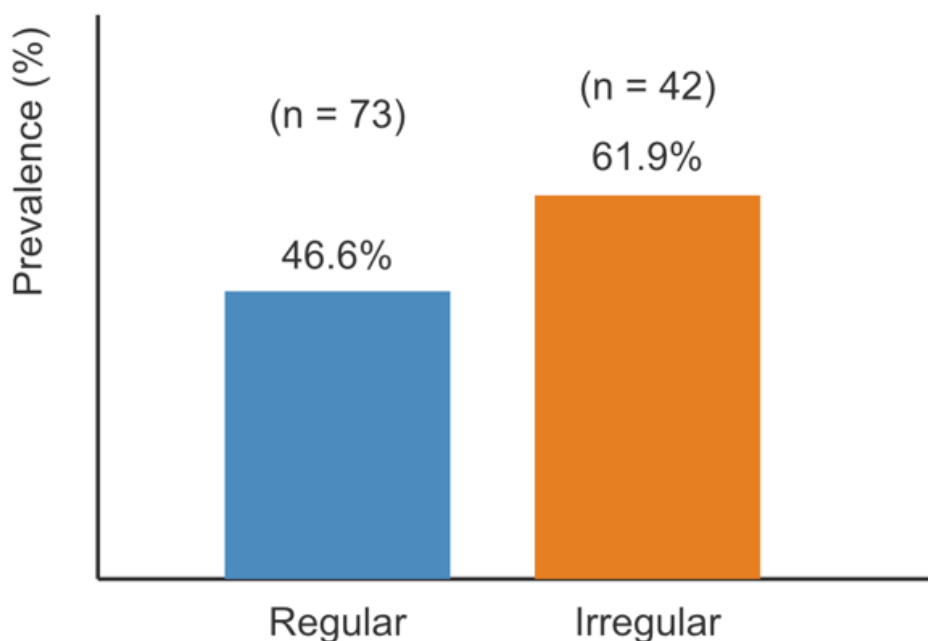


**Figure 3.** Psychological and Sleep Conditions (N=115).

### 3.3. Exploratory Association Analysis

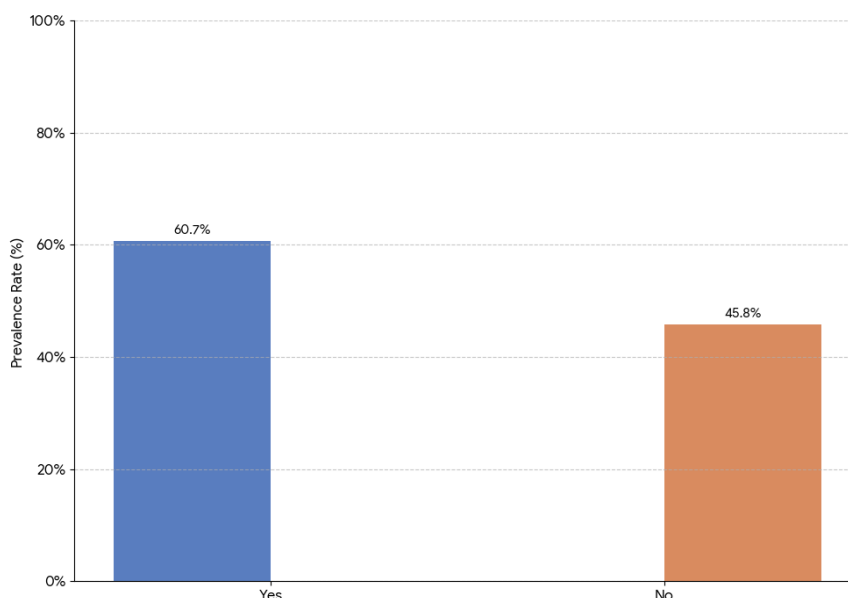
To explore the relationships between variables, this study conducted exploratory cross-tabulation analysis.

First, the relationship between health behaviors and health consequences was analyzed. The results of the research presented in Figure 4 also explored the connection between diet regularity and the health of the digestive system. The respondents were divided into two groups: "Irregular diet" (N=42, Irregular) and "Regular diet" (N=73, Regular). It was found that in the "Irregular diet" group, the prevalence rate of stomach disease (defined by "gastritis") was found to be 61.9% (N=26). And in the "Regular diet" group the prevalence rate of stomach disease was found to be 46.6% (N=34).



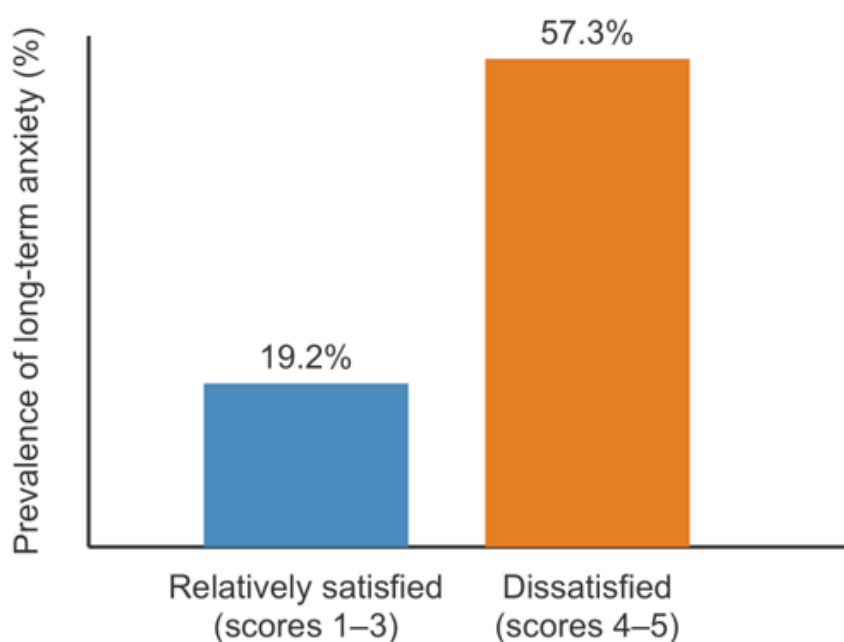
**Figure 4.** Gastrointestinal Disease Rate by Diet Regularity.

Secondly, the association between psychological state and health outcomes was considered. In Figure 5, it is shown that in the group reporting "long-standing pressure/anxiety" (Yes, N = 56), the percentage of those having cardiovascular disease is 60.7%, while in the "No" group (N = 59), the prevalence is 45.8%. This suggests that there is a non-negligible relationship between psychological stress and cardiovascular health.



**Figure 5.** Cardiovascular Disease Rate by Reported Anxiety.

Finally, the relations of the perceived economic pressure to the psychological state of the examined population were explored, see in Figure 6. The drivers were divided for this investigation into two groups with respect to their reported income dissatisfaction, namely the relatively satisfied group (1–3 points, N = 26, where lower scores indicate higher satisfaction) and the dissatisfied group (4–5 points, N = 89). The results show a clear gradient: in the relatively satisfied income group, the proportion of those reporting long-standing anxiety (N = 5) was only 19.2%, while among the more dissatisfied individuals (N = 51), the percentage was 57.3%. This indicates that higher income dissatisfaction is associated with a much higher prevalence of long-term anxiety.



**Figure 6.** Rate of long-term anxiety by income dissatisfaction (1 = very satisfied, 5 = very dissatisfied).

## 4. Discussion

### 4.1. Economic Strain and Health Crisis: A Core Pattern

The most important finding of this research was the depiction of a group under strong economic and operational strain. As shown in Table 1, the sample (N = 112 males) reported a mean of as high as 4.07 on income dissatisfaction (SD = 1.09) on a 1–5 scale (1 = very satisfied, 5 = very dissatisfied), indicating that most drivers are far from satisfied with their current income. At the same time, this group still regarded "continuous decline in freight rates" (82.6%) as the primary stressor (Figure 1) and reported extremely prevalent health problems: MSDs prevalence rate 90.4%, cardiovascular disease prevalence rate 53.0% (Figure 2).

This indicates that, for the truck driver occupation, perceived income is not only insufficient to offset the health costs of work but is itself a major source of stress. Even where absolute income levels may appear relatively high compared to some other blue-collar jobs, drivers still experience strong dissatisfaction and economic pressure. This suggests that interventions cannot merely stop at nominally "increasing income," but must go deeper into the levels of reducing income-related volatility and costs, improving work conditions, and implementing health behavior interventions [6, 9, 10].

### 4.2. Exploratory Verification of Transmission Pathways

Through exploratory analysis, this study found three clear and verifiable association pathways in the survey data, which provide possible explanations for the aforementioned pattern.

The first is the "behavior-health" pathway. As shown in Figure 4, one of the most powerful findings of this study is the verification of the direct association between "irregular diet" and "digestive system diseases." The prevalence rate of stomach disease for those with irregular diets (61.9%) was notably higher than for those with regular diets (46.6%). This illustrates that poor health behaviors (irregular diet) caused by work pressure (e.g., timeliness requirements, lack of fixed meals) are the direct cause of the high rate of stomach disease among drivers [10]. This provides the clearest handle for health interventions.

The second is the "psychological-health" pathway. As shown in Figure 5, drivers self-reporting "long-term pressure / anxiety" (sourced from the "psychological status" item), their cardiovascular disease prevalence rate (60.7%) was significantly higher than the group with no such report (45.8%). This supports the "stress-psychology-somatization" model in data [6]. It indicates that beyond income-related factors, the long-term mental tension (anxiety) brought by work is still causing actual damage to the cardiovascular system.

The third is the "stressor-psychological" pathway. As shown in Figure 6, drivers with higher income dissatisfaction (scores 4–5) reported a much higher rate of long-term anxiety (57.3%) than those who were relatively satisfied (scores 1–3; 19.2%). On one hand, this shows that the source of anxiety is multi-dimensional (not just income). On the other hand, the data confirms that economic factors are still an important driver of psychological stress: higher perceived income dissatisfaction is clearly associated with a higher likelihood of reporting long-term anxiety.

### 4.3. Limitations

This study based on survey data, while ensuring the authenticity of the analysis, also exposed its limitations. First, regarding measurement tools, this study used "single-item measures" as proxies for core variables (e.g., using "psychological status" to measure "anxiety", using "eating behavior" to measure "diet"). The reliability and validity of these items are limited, far inferior to standardized psychological scales (e.g., the Generalized Anxiety Disorder 7-item scale (GAD-7), the Patient Health Questionnaire-9 (PHQ-9)) or detailed diet logs (NFR) [11, 12]. Second, regarding research design, this study's cross-sectional design cannot determine strict causal relationships. For example, whether anxiety leads to cardiovascular disease, or cardiovascular disease exacerbates anxiety, or if a third variable exists (e.g., sleep disorders) that simultaneously causes both [13]. Finally, regarding

data coding, the "age" and "driving experience" in the questionnaire are both categorical variables, which limits the possibility of conducting more precise statistical analyses (e.g., regression).

## 5. Conclusion

This study conducted an exploratory analysis based on survey data from 115 (mainly male) truck drivers. The core finding of the study is a key pattern: the respondent driver group has pronounced income dissatisfaction and simultaneously endures immense operational pressure, and is accompanied by extremely severe health problems, including high-incidence musculoskeletal disorders, cardiovascular diseases, and digestive system diseases. This study, through exploratory analysis of available data, confirmed the significant associations between poor eating habits and digestive system diseases, long-term anxiety and cardiovascular diseases, and income dissatisfaction and higher anxiety rates. The study's conclusion indicates that, under conditions of pronounced income dissatisfaction and operational stress, the work characteristics of the freight industry, and the poor health behaviors and psychological stress derived from them, are still the fundamental reasons damaging practitioners' health. Future interventions must transcend mere economic incentives and turn towards the optimization of work processes, the guidance of health behaviors, and the construction of psychological support.

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