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The Impact of Lunch Breaks on Employee Health and Productivity: Exploring Nutritional Composition, Timing, and Workplace Efficiency

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Abstract: According to the survey, the world's office workers are currently facing sever health problems, especially digestive and psychological diseases. Most digestive problems are caused by employees being tired of work and neglecting to eat regularly, especially at lunch. Therefore, this study hopes to conduct a regression analysis to determine the relationship between lunch time and work efficiency by surveying the lunch canteen dining situation and afternoon office efficiency of the office population. The study shows the control variables, especially the control subjectivity, were not sufficiently prepared, resulting in poor data stability. More objective questionnaires could be designed in future studies to obtain more stable data.

Keywords: Employee Productivity, Nutritious Lunch, Working Environment, Happiness Rate

1. Introduction

In the global survey for 2023, 44%, 30% and 25% of respondents respectively believe that mental health, stress and obesity are the main health problems they face [1]. The above reasons also make office people prone to chronic diseases, such as metabolic syndrome, musculoskeletal diseases, etc. These diseases also contribute to a decline in health-related quality of life in this population [2]. Among them, most of the diseases related to digestion and metabolism are related to employees' irregular eating habits, and due to the backlog of work, a large number of employees choose to postpone lunch time or end lunch consumption in a short period of time before returning to work. In addition, in terms of employees' dietary choices, some employees have been consuming unhealthy foods for a long time, such as high-temperature fried foods, foods with high fat content or high sugar content, resulting in unbalanced nutritional intake, excessive obesity or organ failure[3]. Reduced employee health levels. Therefore, changing the lunch habits and the structure of employees' diets to make them more nutritionally balanced may improve this situation. This article will examine the impact of employee lunch on health and the sustainable improvement of employee productivity. This paper uses quantitative research to investigate and analyze the lunch situation and afternoon office efficiency of employees, so as to provide a basis for enterprises to improve the working environment and improve employee happiness.

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2. Literature Review

2.1. Food Intake

Since 1986, people have been studying the effects of diet on the human body, especially in cognition and consciousness. The amount of food and the amount of carbohydrates and protein consumed will have an impact on human cognition[4]. Research at this time also focused on the food itself, rather than on the act of eating lunch itself.

According to Fernando's research, people began to use the study of the nutritional composition of food to promote human health and believe that high-quality food, as well as the process of eating it, is an important part of the evolution of the human brain[5]. In 2014, Ron proposed that making food choices is an important component of human achievement in the workplace[6]. It can be seen that human beings have a relatively complete study on dietary composition.

In a 2019 study by Jesus et al., it was proved that untimely food consumption has a significant impact on body weight and metabolism[7]. At the same time, the consumption of caffeine and alcohol at the same time as food can also affect the energy intake of the meal, or lead to the delay of subsequent meals. All of the above behaviors have a certain catalytic effect on chronic diseases. At this time, the research has already covered the effects of meal time and food characteristics on the human body. The goal of the study has also shifted from the substance consumed to the act of eating.

Although many researchers have done a lot of research on the effects of dietary nutrients and different times of eating food on the human body, there are few studies on the way of eating lunch, the dining environment and the dietary structure, and more research focuses on the effects of breakfast and dinner. Therefore, the study will focus on the specific timing, composition, and environment of lunch, and analyze its mental and physical effects on the human body.

2.2. Labor Productivity

Since the Hawthorne experiment of 1924-1932, it has been concluded that appropriate improvements in the working environment or satisfaction of employees can increase employee productivity and productivity. However, the specific method for achieving this remains unclear.

In the 2015 study of the impact of human capital investment on productivity in the European Union, Azorín et al. specific to what inputs have a greater impact on productivit[8].

In the 2022 study by Lohela-Karlsson et al, employee attitudes are linked to productivity[9]. It mentions the occupational health of employees, or OHS. When employee satisfaction with their work increases, productivity also increases, but the premise of satisfaction improvement is an increase in the OHS coefficient. The OHS coefficient is the embodiment of the balance between work and health, and lunch is an indispensable part of a healthy life and an important process that supports employees' energy intake at work in the afternoon. Therefore, studying the impact of lunch on productivity is an important breakthrough for enterprises to improve production efficiency.In addition, OSH is a key component in achieving the 2030 Sustainable Development Goals for society [10].

2.3. Lunch & Productivity

In Maryam's study, OHS was linked to productivity in terms of disease and unintentional injury[11]. It demonstrates the importance of OHS, measuring the impact of employee health on productivity on a variety of indicators, but most of them are related to sudden accidents and critical illnesses. However, there is a lack of data and conclusions on the impact of chronic diseases, mental illness, and stress on productivity. There is also a notable lack of analysis regarding the potential for chronic illness among employees. Therefore, this article will analyze productivity in conjunction with the

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health-related component of OHS that affects the health of chronic diseases and the employee lunch diet, which is the only company-controlled meal.

3. Methodology

This study is quantitative. The research subjects of this experiment are the health status and work efficiency of long-term office workers. The experimental sample will be randomly selected from different positions of employees in departments that require long-term office work in the enterprise. To ensure a strong representative and sufficient quantity of samples. In addition, due to the fact that in countries and regions other than Sweden, the second favorite way to have lunch is to dine in the cafeteria [12]. Step1 Design the questionnaire. The questionnaire was divided into two parts, the attitude towards lunch, and the evaluation of health status. The lunch attitude is mainly to make a comprehensive evaluation of the time, environment and dietary structure of the lunch provided for the company, and the corresponding score is designed, which is 1-10 points. 1 out of the most disappointed and 10 out of is very satisfied. Employee health status is mainly evaluated by the employee health index, which investigates the chronic diseases of employees under the current lunch conditions and converts them into the corresponding health index. Again, a score of 1-10 is used as a criterion. Step2. Evaluate the efficiency of employees. The efficiency of employees in handling work between 14:00 and 17:00 in the afternoon is judged based on the completion time of a single project. This is quantitative data. Step 3 Distribute the questionnaire. The questionnaire will be distributed to employees in the form of an online survey.The experimental data comes from the questionnaire and belongs to the first-hand data. Determine the confidence level, assuming a certainty of 95% and a confidence level of 1-5%. Limit the sampling limit error and calculate the variance of the number of respondents The sample size is obtained by multiplying the square of the confidence by the square of the variance and dividing the square of the error value of the limiting sampling limit.

4. Data Analysis

A total of 52 questionnaires were distributed in this survey, of which 19 were valid data that met the criteria.

Step1 Integrate the questionnaire data, summarize the scoring data in the questionnaire in the EXCEL table, and import the obtained data table into the SPSS system.

Step2 Cleanse and preprocess the collected data, and process the outliers in the score, such as the value that is too abnormal due to chronic diseases before work. Handle a large number of duplicate values at the same time to ensure the authenticity of the survey data.

Step3 Calculate the mean and variance of the three data of lunch attitude, health status and employee work efficiency.

Step4 Predict the calculation results of the data.

Step5 Perform a chi-square test on the three in step 2 to determine their relevance and independence.

Step6 Evaluate the analysis model used. It mainly evaluates the degree of fitting of the model to the test data, and adjusts the relevant parameters of the model test to improve the accuracy of the test. Interpret and report on the resulting data, especially for relevance, to ensure that managers can understand the link between the company's lunch provision and employee productivity and well-being, and plan for improvement.

After identifying the relevance, the management made improvements to the lunch design, especially in terms of dining time and environment. And repeat the above experiment after a period of time. After obtaining the results, conduct a variance analysis with the mean obtained from the first experiment, and perform a difference analysis on the results to observe whether changing the lunch

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situation can have an impact on employee work efficiency. The survey data obtained in this experiment will be used with the consent of the respondents to ensure that the health information of the respondents is not disclosed. In addition, respondents will be surveyed anonymously. Due to the inability to completely exclude influencing factors such as employee education level, cultural background, etc. in the experiment, this result does not represent the final experimental conclusion.

5. Results

5.1. Lunch Nutrition and Dining Environment Assessment

According to Cafesano, the dining environment is an important factor affecting people's health, and factors such as lighting, crowding, interior design, and meal delivery speed should be considered to enhance the dining experience[13]. Therefore, in this survey, based on the above criteria, canteens that meet sufficient lighting, spacious dining environment, fast serving, and comfortable interior design conditions are rated as 10 points, and those that do not meet any of them are rated as 0 points.

The average score is 5.53, which is greater than 5 points, indicating that the respondents are currently satisfied with the dining environment. And the variance is 8.93, indicating high volatility and instability of the data.

Due to the fact that proteins, fats, and carbohydrates are the most fundamental substances that make up biological structures and maintain physiological activities in human life [14]. Moreover, Brittany points out that vitamin deficiencies can induce fatigue within the human body, emphasizing the vital role of adequate nutrition in maintaining overall health and energy levels[15]. Therefore, the survey evaluated whether lunch contained protein, fat, carbohydrates, and vitamins. If lunch contains only one of the four substances, it is 0 points. If it contains four substances, it is 10 points. About mean and variance of nutritional data, the mean is 2.21 and the variance is 10.059, indicating that the respondents' ratings of nutritional data are very unstable.

5.2. Assessment of Dining Time

According to the valid survey data, 26% of the respondents spent their lunch time between 11:30 and 12:30, while only 10% of took a two-hour break between 11:30 and 13:30. Therefore, if the lunch time provided by the

Enterprise is less than 1 hour and the start time is later than 11:30 or the end time is earlier than 13:30, it is considered as 0 minutes. Lunch time exceeding 2 hours and starting no later than 11:30 and ending no earlier than 13:30 will be scored 10 points as the main evaluation criteria. After SPSS analysis, the mean of this data is 2 and the variance is 8.639, indicating a high degree of dispersion and significant data fluctuations.

5.3. Health Index Evaluation

The survey uses the severity and frequency of patients' chronic diseases as evaluation indicators to assess their health index. The category of "Very unhealthy" receives a score of 0, signifying that chronic diseases have progressed into illness. Those who suffer from chronic or mental illnesses and have a frequency of 2-3 episodes per week receive 5 points, while those who do not have illnesses receive 10 points. The survey shows that 63% of the respondents have a health score of 0 in the valid data, and the proportion of very unhealthy is higher than 50%. According to SPSS analysis of frequency, the mean score is 3.16, which is less than 5, indicating that the employee's health status is poor under current working conditions. In addition, the variance of this part of the data is 20.02, indicating a high degree of dispersion, strong volatility, and instability.

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5.4. Comprehensive Impact Assessment of Lunch Nutrition, Dining Time, and Health Index

According to the SPSS regression analysis results, at a 95% confidence level, the Pearson coefficient between lunch time and health index is 0.591, which is greater than 0.5, indicating a strong positive correlation between lunch nutrition and health index. The higher the lunch time score, the higher the health index score. The longer lunch time is provided, the lower the probability of employees suffering from digestive diseases. In addition, the P-value of the two is 0.008, which is less than 0.05, indicating that there is no significant difference between them. This model can prove the relationship between lunch time and health index.

SPSS result analysis shows that at a 95% confidence level, the Pearson coefficient between lunch nutrition score and health index is 0.143, which is less than 0.5, indicating a negative correlation between the two, and the higher the lunch nutrition score, the lower the health index. The p-value which is greater than 0.05, indicates the low significance of the two variables. This model cannot accurately explain the relationship between the two and further investigation is needed.

5.5. Assessment of the Impact of Lunch on Work Efficiency

Evaluation criteria: In this evaluation, work efficiency is rated based on the percentage of employees completing one task per hour.

Complete every 10% -1 point. The SPSS result analysis showed that at a 95% confidence level, the Pearson coefficient between lunchtime score and work efficiency was 0.44, which is less than 0.5, indicating a negative correlation between the two. Moreover, the higher the lunchtime score, the lower the work efficiency index. And the p-value of the two is 0.06, which is greater than 0.05, indicating that their significance is low and the model investigation needs to be updated. The SPSS analysis showed that at a 95% confidence level, the Pearson coefficient between lunch time score and work efficiency was 0.023, which is less than 0.5, indicating a negative correlation between the two. Moreover, the higher the lunch nutrition score, the lower the work efficiency index. And the p-value of the two is 0.925, which is greater than 0.05, indicating that their significance is very low and other models need to be used for investigation.

6. Discussion

6.1. The Way of Research Process

At present, research on the impact of providing lunch in corporate canteens on health status and work efficiency has been conducted using SPSS regression analysis. It was found that the survey method of classifying and scoring satisfaction with lunch time has significant effects on the study of employee health index and is an effective model. It can be proven that there is a positive correlation between the two. In this section, we will explain the connection between the research results and known literature, as well as other findings and limitations of the study.

6.2. Connection between results and literature

From the results, it can be seen that when lunch time is provided for a longer and more reasonable period of time, the health level of employees will be improved. This is consistent with Jan that proposal to increase the emphasis on employees' lunch breaks, which can improve dietary diversity scores[16].

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6.3. Other findings and Insufficient Research

When evaluating work efficiency as a percentage of completion, the model may lack significance due to its subjective evaluation and lack of objective data. The results of lunch nutrition, time, and health index variance showing much greater than the mean indicate that the data dispersion is too high, the data stability is too low, and the results presented in different groups are also different. In addition, there were 52 samples in this survey, but only 19 qualified samples, which is too small and the results obtained are not universal. In addition, the data from this study lacks long-term impact studies, and the data collected in a relatively short period of time is a valid short-term recommendation for improving the well-being of employees.

7. Conclusion

The model proposed in this study does not significantly address the relationship between lunch time and employee well-being, highlighting the need to improve research methods and survey approaches, particularly in questionnaire design, to minimize subjectivity. However, the findings on lunch time settings suggest that providing lunch between 11:30 AM and 1:30 PM, with a two-hour duration for employees to eat leisurely, can reduce the incidence of chronic diseases, improve employee health, and enhance occupational health and safety (OHS) to some extent.

Future research should explore the impact of nutritional balance on work efficiency and examine how different nutritional compositions influence task completion. In addition, the impact of employees' personal emotions or preferences on the survey needs to be considered in future studies. It would be valuable to investigate how lunch time settings across various occupational groups affect afternoon work efficiency. By refining research methods and further exploring the influence of lunch timing and nutrition, future studies could provide deeper insights into optimizing employee health and productivity.

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