

An Exploratory Case Study on Employee Health and Wellbeing: Indian Railways Case Study

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Introduction and Background

International organisations such as the World Health Organisation (WHO) stipulate the nutrient intake parameters for individual nutrient requirement for individuals and this guideline has been followed by India as a basis when determining nutrient intake. The Indian Council for Medical Research (ICMR), following the guidelines prescribed by the WHO, arrived at a base level of nutrient intake which has been followed since 2009 as a basic guide.

The guidelines prescribed in 2009 accommodate variations in recent social status of Indians, reduced physical activity levels, aspects, and micro nutrition and under nutrition conditions affecting Indians. Based on these parameters, the expert group concluded contributing to energy, protein, calcium, fat and iron levels. The expert group also concluded that a BMI of 20.3 is appropriate for a population between 18 and 30, with height of 172 Cm and weight of 60 Kg, and for women with height 161 cm and weight 55 Kg, for the general population group.

In terms of other body composition, the ICMR expert group indicated that for men (sedentary), a total fat level of 20% is appropriate, a protein level of 10, equated to 25 g/p/d. Similarly protein is fixed at 60 g/kg/d. Required energy for men with sedentary work is 2500 m/g/d. These levels vary for women.

Based on the above guidelines, it is assumed that if an individual derives such components, then they are considered to be attributable to an individual's wellbeing status, and these will influence the organisational factors such as productivity, revenue, and expenses etc. This prompted us to posit the research question:

What is the health & wellbeing status of individuals in an organisation?

The above question, while looks simple to posit, contains a complex nature of data collection as many organisations do not assess health & wellbeing status regularly, and then document the same into the employee records. While the working conditions and organisational factors can be attributed to these, we felt that there is a lack of awareness in this domain, and this could be a main cause for concern. Southern Railways (Southern Railways) to conduct a pilot study to assess the health & wellbeing of their employees so that awareness can be spread across Southern Railways because we understood that a Master Health Check Up was conducted in one of their factories in 2012 and was very keen to promote Health & Wellbeing initiatives among its employees.

We approached the Chief Medical Director Dr. Ram Prakash to explore the possibility of such a pilot study and this initiative was approved.

Research Method

This study used a single organisation case study approach as the main method. The organisation is Indian Railways Headquarters for our sampling due to convenience.

We followed a case study approach for literature clearly supports data collection through case studies in specific organisations. Literature also supports case study approach as an appropriate approach in the exploration research study [3].

The case study approach we employed consisted of observation, individual discussions, formal individual interviews and focus group discussions.

This research study collected research data through three stages as indicated in the abstract section. The data collection involved a survey form, blood samples and pathology testing, and finally body composition analyses using a bio-impedance monitor.

Nutritional data collection

The first stage of data collection involved a baseline assessment using a mixed method approach. Literature also supports a theory-building stage to be able to develop appropriate questions to sort the real answers in this study [4-7]. The approach followed by a quantitative approach. In order to produce evidence that the outcome of the research is proper due to the exploratory nature of the research project [8-10]. The qualitative interviews involved understanding diet habits through the interviews. The interview questions covered a range of topics such as eating habits, quantity of food consumed, physical activity levels were recorded and then transcribed for analysis. The data collected was then transcribed into a nutritional software application.

Blood sample data collection

The second stage of data collection pertained to pathological validation. Qualified medical professionals from the Railways Hospital assessed fat level, diabetic condition, and other mineral levels. The blood samples were then analysed in the hospital pathology department using a nutritional software application.

Bio-Impedance data collection

The third and final level data collection involved assessment on body fat and fluid composition. A bio-impedance monitor was used. Due to time constraints, at the time of writing, only participants assessed as non-diabetic were subjected to this data collection.

Sampling

We received Institutional Ethics Approval from the Chief Medical Director of Southern Railways to conduct the study. Once the study protocol was approved, a formal invitation was sent to the 'office cadre' in the headquarters building in Chennai. They were invited to the study and the data collection procedural aspects, and it was clearly stated that the participation was voluntary. The study did not exercise any screening criteria.

In total 122 individuals were involved in the data collection over a 10-week period. The sampling technique used was 'random sampling' on the basis of voluntary participation. This was crucial in determining the direction of the study.

Data Analysis and Discussions

The samples were probed with a set of fundamental questions pertaining to their health & wellbeing aspects, mainly concentrated on the type of food being consumed, their frequency, sedentary and non-sedentary habits, alcohol consumption, and other wellbeing conditions of individuals. The data collection instrument is provided as Appendix 1.

The data collection involved both qualitative and quantitative aspects. The data were transcribed into a nutritional software application and verified for accuracy. The nutritional software application produced various nutrient levels based on food consumption. The data were analysed using SPSS application and analysed, leading to the tables produced in this paper. The data were masked for any personal information.

undertaking given to staff while collecting data.

The data were not amended. Any potential bias was eliminated at the time of data analyses by removing potential self-reported data. We assured that the outcomes projected in this report are independent, unbiased, and views expressed by employees as wellbeing aspects.

Reliability of the Data

We conducted a reliability test on the data using Cronbach Alpha method. The reliability was quite low. The low level of internal consistency was scattered and the total number of items was low to be able to get a true reflection of reliability. It should be noted that on the analyses of data (Table 1).

We conducted standard descriptive tests on the data. The following tables provide the results of descriptive statistics (Table 2).

The mean of the age is only 50 years, with minimum age at 27 years, and maximum age at 68 years. The data indicates that 10% of the participants are 18 and above (Table 3).

The participants were not equally distributed in terms of gender, with 60% of the participants were male and 40% female.

Blood pressure of the cohort showed that 48% are considered within the normal blood pressure and 49% of the participants are hypertensive.

We ran descriptive statistics for other variables and found that 59% of participants had a normal family history indicating no heart disease. 58% of the participants indicated that one of the parents had diabetes.

44% of the participants reported a family history of hypertension, and 18% reported family history of cholesterol.

Among the participants, 8% reported smoking habit and 11% reported alcohol consumption.

The low reliability value of data prompted us to conduct a factor analysis. We used a varimax rotation and the factor analysis returned five groups of factors as strong contributors to health & wellbeing of participants. We arbitrarily titled them as Physical Activity, Family History Unknown and Diabetic (Table 5).

The participants exhibited strong levels of hypertension, cholesterol and hypothyroid. When the calorie levels were examined, we found a high level of energy consumption (average 2100 calories) per day. The intake of sugar is also highly loaded (0.813) indicating high sugar intake. The negative correlation value (0.707) on family diabetic history, and family history unknown factors (0.591) indicates factors of lack of health & wellbeing.

We also conducted a bio-impedance test using a monitor. This test was conducted on 39 participants who were found to have a body fat percentage of 24.6 and the BMI was 26.7. When we split the data for male and female, we noticed that the males had a higher fat percentage (26.5) and BMI (27.5) compared to females (22.7 for fat mass and 23 for BMI).

In addition to the factor analysis, we also conducted a basic regression model. The model summary is shown in (Figure 1). Diabetic History was returned as a strong predictor and the current levels of fat and protein are contributing to a trend in the data. We are able to find evidence in the nutrition software for this as the energy consumed is about 2100 calories per day and energy expenditure is about 1800 calories per day on reported activities for the participants. Further, high levels of fat masses and cholesterol also indicate lack of 'burning' of calories.

Inference

The data analyses and the interviews indicated that majority of the participants had a high intake of calories (about 1800 calories) and expended about 60 Kcal on a daily basis. We also noticed that participants had a high level of Cholesterol, BMI and free fatty acids. 10% of the participants had high levels of hypertension (Table 6).

The data derived from the nutrition software application indicates that some minor adjustment to participants' diet would be beneficial. For example, we noticed that the average diet consisted of Beans, Chicken curry, Coconut chutney, Dhal fry, Idli, Instant Snack, and Sugar.

The calorie generated from such a diet was calculated as 2560 Kcal. However, our interviews indicate that for a dietary physical activity, leading a BMI calculation of 24.8. This average participant returned a fat mass of 19.74 and a fat mass that the standard is 11- 18 for men and 21-28 for women. If we used the standard measure, the participant is assumed to

Another observation we noticed for this average participant was the prevalence of family history of diabetes and he calculation of risk, the participant is of high risk in terms of developing diabetes, heart disease and hypertension, unless s

When the results are looked at an organisational point of view, there are potential productivity issues as the particip result in absent days due to health & wellbeing issues, as well as critical organisational knowledge not available in demar s hospital expenditure incurred by the organisation either as a one-time expense or as an ongoing maintenance expense.

In terms of family issues, the risk of lack of health & wellbeing can result in sudden loss of family members, or the family at a level expected, and this might result in work downgrade. Such an event might result in loss of income, or in specific family members.

The above risk events are likely in extreme cases, and we are not suggesting that these will occur. However, lack of health adverse effect on individuals and the organisation. The only way to combat this is by organising regular health checks based on health checks. The intervention can address dietary habits, physical activity, awareness programs and more promotes a healthy lifestyle in and out of the organisation!

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