

Quality of Working Life and Nutritional Status in a Sample of Industrial Workers

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Abstract

Linkages between diet habits and the quality of working life is a new phenomenon and continue to surface on many fronts. Evidences are there that dietary and non-dietary components are capable of influencing workplace activities, work life, and thereby work performance and productivity. This cross sectional study examined the quality of working life (QWL) and nutritional status of a representative group of sixty-five male workers in an industrial setting. Quality of work life index was measured by administering the scale developed by Yousuf. Nutritional status was assessed by 24-hr food recalls and anthropometric measures. The measured score for QWL ranged 185.0-212.0 with a mean of 193.83 ± 5.57 , which is about seventy three percent of the totals, suggestive of 'medium' quality of QWL. Older with longer job experience, having higher salary and poorly educated workers showed significantly higher QWL score ($p < 0.01$). They seem content with their work life and are satisfied in their job. Food and nutrient intakes were inadequate both in quality and quantity. Mean calorie intake was 2196 ± 400 kcal (79% RDI). Cereals and roots/tubers were the major contributor of energy (65% of the total) and protein consumed. Intakes of egg, meat and milk products were very poor. About twenty percent of the workers measured undernourished ($BMI < 18.5$). Moderate level of QWL compounded with poor and inadequate nourishment would certainly compromise work performance and thereby contribute to low productivity.

Key Words: Quality of working life (QWL), shift workers, job satisfaction, food consumption pattern, nutritional status.

Introduction

Bangladesh is a small impoverished country in the South Asian green belt with over 140 million people. In recent time, the country is transforming, though with a slow pace, from largely agrarian underdeveloped economics into dynamic industrial country. The contributions of industry and agriculture sectors in the country's GDP in 2004/2005 were 28 percent and 22 percent respectively¹. Industries (manufacturing sector) expanded at an average rate of 6.44 percent per annum throughout the years of FY 1972-2005. Eleven percent of the country's labour force is engaged in industrial sector. The workers are the driving force of the national economy, and thus evaluation of their working lives, work-

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tasks and identification of work exposure, their health and life style, living environment etc. calls for. Popular human relations view is that a satisfied worker is a more productive worker. 'Quality of working life' is a generic phrase that covers a person's feeling about every dimension of work including economic rewards and benefits, security, working conditions, organizational and interpersonal relationships, and it's intrinsic meaning in a person's life². It refers to a relationship between the worker and work environment. Human health, disease, productivity, socioeconomic development, quality of life index etc. are directly related and dependent on nutrition. Poor nutrition underlies workplace issues like morale, safety, productivity and long term health of the workers and nation. There is little doubt that nutrition and health are intimately linked with physical activity and productivity. Evidences are there that dietary and non-dietary components are capable of influencing workplace activities, work life, and thereby work performance and productivity.

Therefore, the present study was conducted with the major objective of investigating quality of working life narratives of the workers in an industrial setting and to document their food intake and health status.

Materials and Methods

This cross sectional study was conducted on a total of sixty five individuals selected by simple random sampling from the study population of 414. The setting of the study was Tejgaon industrial area in the capital city of Dhaka.

Sample selection and sample size estimation

The nature of the study (behavioural research) calls for to follow the 'rule of thumb' allowing us to draw a sample of 10% of the total population for scientific representation. Therefore we needed only 42 subjects, but for better representation sixty-five workers (30 from the morning shift and 35 from the evening shift) was enrolled. Consent was obtained from the factory authority and the worker. Randomization was done from among the workers of both the shifts (morning and evening) that consented to take part in the study.

Variables and measurements

A set of structured questionnaire were administered to the selected participants to obtain general information of the workers and to assess their quality of work life and food intake. The questionnaire was validated by a pilot study before starting the main research. To do this, the questionnaire was distributed to 15 individuals with the same characteristics and from the same area as main study participants. After assessment and evaluation of the research results of this pilot, the main research started.

Quality of working life. The instrument (questionnaire) used in the present study was developed by Yousuf³. The questionnaire consisted of 27-items. Responses were elicited on 11 point scale ranging from worst possible work life (score 0) to the Best possible work life (score 10). The items on perceived growth, perceived mastery, perceived involvement, perceived control-in-contexts, and perceived stimulation-in-contexts, were

recorded on 5-point Likert type scales. Likert scoring system was followed for both positive and negative items on workers attitude on the variables of the nature of the present job, opportunities for promotion, present pay, people on present job and supervision on present job. These were measured through an adjective checklist having binary (Yes/No) responses. For minimizing the effect of response set, some of the items were negatively worded. The total weighted score for QWL is 265, and was classified into three groups- 'Good' (more than 80%), 'Medium' (60-80%) and 'Poor' (less than 60%).

Diet history. Dietary intake data on the type and amount of food during the previous 24-hours were collected by interviewing the workers. Values for energy and nutrients were computed from local Food Composition Tables⁴.

Anthropometry. The heights and weights of the workers were measured using a wooden stadiometer and pre calibrated digital weighing scale (SECA). The measurements were taken single handedly by a trained person to avoid inter-observer errors. The subjects wore light clothes and no shoes during measurement. Height was measured to the nearest 0.1 cm and weight was measured to the nearest 0.1 kg. The weight (kg) was then divided by the height (m²) to calculate the Body mass index (BMI), which is considered a good indicator for evaluating adult nutritional status, because it is inexpensive, non-invasive and reliable.

All the participants were interviewed personally respecting their privacy. The respondents were fully assured of the fact that their responses would be kept strictly confidential and would be utilized only for research purposes.

Data Analyses. The data were entered and processed by SPSS release 12.0 and ANTHRO software packages. Paired comparisons were performed by student *t-test* and analysis of variance. Chi-square test was performed to test the difference in proportions of categorical values. Pearson product moment correlation was used to estimate the correlation between the items. Differences were considered statistically significant when *p* value was less than 0.05.

Results

Characteristics of the study subjects

The characteristics of the study population are shown in Table 1. The mean age and experience of the workers were 35 ± 11 years and 16 ± 11 years respectively. About half of the observed work force was found working more than 10 years but less than 20 years. Forty six percent of them work in the morning shift and fifty four percent in the evening shift. Of them 52% are either illiterate or had primary level and 48% had secondary level of education.

Table 1: Study group characteristics (n=65)

Characteristics	n (%)	$\bar{X} \pm sd$
Shift		
Morning	30 (46.2)	
Evening	35 (53.8)	
Age group (years)		
18-29	29 (44.6)	
30 & above	36 (55.4)	35 ± 11*
Educational level		
Illiterate / Primary	34 (52.3)	
Secondary	31 (47.7)	
Job experience (years)		
Less than 10	20 (30.8)	
10-19	32 (49.2)	16 ± 11*
20 & above	13 (20.0)	
Salary		
up to 2500	49 (75.4)	
2501 - 4000	16 (24.6)	2184 ± 566*
Marital status		
Single	9 (3.8)	
Married	56 (86.2)	

* Values are the mean with standard deviation

General food pattern

Reported consumption of food items or food groups are presented in Table 2. Overall, the food patterns of the workers were based on rice, roots and tubers, and vegetables i.e., on plant foods. Consumption of egg, meat pulses and milk/milk products were poor.

Table 2: Mean per capita food intake (in gram)

Food items	Cereal (rice, wheat)	Rice	Root and tubers	Sugar	Pulse and nut	Vegetables	Fruits	Meat	Egg	Fish	Milk/ Milk products	Fats and oil	Misc.
Mean (SD)	439 ± 92	403 ± 104	174 ± 130	5 ± 5	27 ± 23	154 ± 157	23 ± 48	12 ± 39	6 ± 14	54 ± 77	14 ± 35	18 ± 4	14 ± 25

Calorie and nutrient intake

In the Table 3 the mean intakes of energy and nutrient, their corresponding RDI and the percent fulfillment to the requirement are shown. It was found that the mean energy intake was 2196 ± 400 k cal/day showing signs of energy deficiency, fulfilling nearly 80% of the demanded requirement. Rice is accounted for 65% of total energy. Rice also contributed the largest amount of protein, which is of low bio-available value for protein activity. Protein intake was more than the requirement. Contribution of fat and riboflavin in the daily intake were also very poor, contributing only 30 and 34 percent of their

requirement. Intakes of vitamin A and iron were found to be two-thirds of their required level. The mean intakes of energy and nutrients by the observed industrial workers working at different shifts are shown in Table 4. The mean difference was not significant between the groups for any of the nutrients excepting thiamine and vitamin-C. Higher intakes of these two micronutrients were observed among the workers in the morning shift than their counterparts ($p < 0.00$).

Table 3: Energy and nutrient daily intakes and percent RDI

Energy and Nutrients	Mean (SD)	RDI*	Percent of RDI
Energy (kcal)	2196 ± 400	2788	78.77
Protein (g)	58 ± 23	53.7	109.43
Fat (g)	28 ± 7	92.0	30.44
Carbohydrate (g)	431 ± 86	-	-
Calcium (mg)	552 ± 778	450	122.67
Iron (mg)	14 ± 9	18	77.78
Vit-A (IU)	1415 ± 2628	2000	70.75
Thiamine (mg)	1.38 ± 0.33	1.39	99.28
Riboflavin (mg)	0.57 ± 0.32	1.67	34.13
Niacin (mg)	21 ± 5	19.0	110.52
Vit-C (mg)	57 ± 40	50.0	114.00
Zinc (mg)	9 ± 3	-	-

* Source: INFS-BNNS, 1995-96

Table 4: Per capita energy and nutrient intake (mean ± SD) by shift

Energy and Nutrients	Shift		p-value
	Morning	Evening	
Energy (kcal)	2271 ± 405	2131 ± 391	.16
Protein (g)	58 ± 14	58 ± 29	.97
Fat (g)	29 ± 7	27 ± 7	.31
Carbohydrate (g)	449 ± 93	416 ± 78	.12
Calcium (mg)	408 ± 268	675 ± 1023	.17
Iron (mg)	14 ± 6	14 ± 11	.92
Vit-A (IU)	144 ± 241	131 ± 183	.80
Carotene (µg)	4879 ± 8641	10061 ± 19745	.19
Thiamine (mg)	1.52 ± 0.30	1.26 ± 0.30	.00
Riboflavin (mg)	0.52 ± 0.18	0.62 ± 0.39	.20
Niacin (mg)	22 ± 4	21 ± 6	.52
Vit-C (mg)	73 ± 48	42 ± 24	.00
Zinc (mg)	9 ± 2	9 ± 4	.81

Anthropometry

The mean values for weight, height and BMI are presented in Table 5. Seventy-one percent workers were of normal weight by their BMI score. Twenty percent of them were under weight (CED grade-I) and 9% was over weight.

Quality of working life

Table 6 presents the results for clusters of quality of working life. The mean total score attained by the surveyed workers was 193.83 ± 5.57 with a range of 185.0 – 212.0. The observed mean score is considered as ‘average’ (73% of the total) as per grading. No significant group difference could be elicited between the shifts (data not shown). Level of satisfaction on each of the eleven items could be understandable by their scoring against weighted value. Dissatisfaction or negative responses for the clusters like work life, present pay, promotion, control-in-context and stimulation-in-context were referred more. The recorded score for these clusters ranged between 42% and 68% of the weighted value. The clusters drawing most positive responses are growth, people on present job and supervision on present job.

Table 5: Physical characteristics of the subjects

	Mean \pm SD		
Weight (kg)	56.01 ± 7.22		
Height (cm)	164.20 ± 5.74		
BMI (kg m ⁻²)	<18.5		13 (20)*
	18.5-24.9		46 (71)
	>25.0		6 (9)

*Figure in parentheses are percentage

Table 6: Mean QWL scores and percentage of weighted value of the subjects

A priori clusters	QWL score	Weighted value	Percent of reported score
Work life	27.8 ± 5.6	55	50.54
Perceived Growth	19.9 ± 0.5	20	99.50
Perceived Mastery	16.2 ± 1.0	20	81.00
Perceived Involvement	7.6 ± 0.8	10	76.00
Perceived Control-in-Contexts	6.0 ± 0.0	10	60.00
Perceived Stimulation-in-Context	4.2 ± 0.5	10	42.00
Work in Present Job	26.8 ± 0.7	36	74.45
Opportunities for Promotion	10.1 ± 0.3	16	63.12
Present Pay	9.0 ± 0.0	16	56.25
People on Your Present Job	35.0 ± 0.0	36	97.22
Supervision on present job	31.2 ± 0.5	36	86.67
Total score	193.83 ± 5.57 (185.0 – 212.0)		

Table 7: Association of the working place inventory scores of participants by socio-demographic characteristics

Characteristics	QWL score	p -value
Shift		
Morning	192.77 ± 3.18	
Evening	194.74 ± 6.92	.155
Age group (years)		
18-29	191.31 ± 2.91	
30 & above	195.86 ± 6.36	.001
Marital status		
Single	193.11 ± 4.62	
Married	193.95 ± 5.73	.680
Educational level		
Illiterate/Primary	195.56 ± 6.57	
Secondary	191.93 ± 3.41	.008
Job experience (years)		
<10	192.20 ± 3.31	
10-19	192.03 ± 3.80	
20 & above	200.77 ± 6.74	.000
Salary (Tk.)		
Up to 2500	192.89 ± 4.86	
2501-4000	196.69 ± 6.73	.017
BMI		
<18.5	193.15 ± 4.68	
18.5-24.9	193.93 ± 5.86	
25 & above	194.50 ± 5.78	.867

Table 8: Correlation matrix for QWL, age, education, marital status, experience, salary, expenditure and BMI

Variables	QWL	Age	Education	Marital status	Job experience	Salary	Expenditure	BMI
QWL	1.000	.729**	-.303*	.052	.631**	.429**	.295*	.189
Age		1.000	-.338**	.196	.870**	.516**	.483**	.192
Education			1.000	-.053	-.307*	-.104	-.074	.112
Marital status				1.000	.130	.110	.061	.161
Job experience					1.000	.629**	.479**	.102
Salary						1.000	.479**	.219
Expenditure							1.000	.376**
BMI								1.000

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 7 examines the attained QWL score of the observed subjects by their socio-demographic characteristics, which could affect their work life. Positive significant correlations were observed between QWL score and age ($p=0.000$), job experience ($p=0.001$), and salary ($p=0.017$). Those who are aged having longer job experience and getting higher salary seems content with their work life. Dissatisfaction seen among those who have higher level of education ($p=0.008$). Work shift, marital status and BMI shows insignificant influence on the workers life.

The results in Table 8 indicate that there were highly significant positive correlations ($p < 0.01$) between QWL and age, job experience, salary; between age and job experience, salary, expenditure; between job experience and salary, expenditure; between salary and expenditure; and between expenditure and BMI. Significant positive correlation at $p < 0.05$ level, was also seen between QWL and expenditure. Negative significant correlations were observed between education and age ($p < 0.01$); and between education and QWL, job experience ($p < 0.05$).

Discussion

Industrial production is the backbone of national economy, for which there needs to be consideration of the harmonization of work-tasks. Workers are the main driving force for economic growth. Investment in the skills, health and nutrition of the worker is key both to their welfare and to economic success. Job satisfaction serves as a part of quality of working life. Job satisfaction and devotion to the job affects each other reciprocally⁵. The computed score for QWL of the subjects' studied was between 185.0–212.0 with a mean of 193.83 ± 5.57 . High total score indicates better work life, but in our study we found it 'medium'. The medium scoring might contribute to a certain degree of compromise with work life, which in turn could affect productivity. The findings of our study are consistent with other studies that have examined the workers' life style with their work life. In this study the variables-age ($p=.001$), income ($p=.017$), qualification ($p=.008$) and experience ($p=.000$) were seen to influence different dimensions of QWL. The older and less educated with longer job experience are more satisfied than younger and comparatively more educated workers. Job satisfaction is a good indicator of overall quality of work life. These findings are more in line with the results of Khaleque and Rahman⁶. A higher association between age and satisfaction in job was reported by Davis⁷. Professional experience has also been claimed to increase job satisfaction^{8, 9, 10}. It is worthy to comment here that higher the QWL score more the satisfaction.

Adequate nutrition creates positive outcomes and improves quality of life. We did attempt to obtain reliable measures of the subjects' nutritional status in reference to dietary and anthropometric indicators. Access to healthy food was not noticed. Food and nutrient quality of the surveyed workers was inadequate both in quantity and quality. The observed mean per capita energy intake was 22% less than the required level. Moreover, overwhelming presence of cereals in their diet put the nutrient quality of the meal poorer. Mention must be made here that work shift did not make any difference either for the food intake or QWL between the groups. Anthropometrically 20% of the observed workers were found underweight by their BMI values.

Nutrition and activity are two of the essential conditions of daily living. To our knowledge, it has been reported that in developing countries 1% kcal increase can result in 2.27% increase in general labour productivity¹¹. Nutrition appears to improve health related quality of life by enhancing psychological well-being and improving physical functioning. The study findings point out to the need for taking steps to improve the quality of work life thereby improving the satisfaction and performance in respective job of the workers.

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