

## **HUMAN ASPECTS OF SHIFT WORK IN THE DEVELOPING COUNTRIES-I: A CASE STUDY IN BANGLADESH**

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There currently is little information available that allows objective prediction of psychosocial risks and benefits associated with the shift work in the developing countries. To provide such information, this study assessed possible differential effects of fatigue associated with the shift workers' attitude, job satisfaction, psychosocial problems, and other difficulties. Data were collected from the subjective responses on various scales using questionnaire among sixty adult male subjects working on a weekly rotating three-shift system in a shoe factory in Bangladesh. The results indicated that shift work is associated with negative aspects of disturbing their family, conjugal and social lives, curtailed leisure activities, created difficulties in meeting their friends, caused irregularity of their mealtime, affected sleep and caused health problems. However, the effect is significant only for such feelings of social and family aspects, as well as sleepy and lively hood but no significant main effects of shift schedule are observed for any of the behavioural and organizational context.

There is a competitive situation involved in getting a job due to over population and a high unemployment rate in Bangladesh. Many people come from destitute rural areas having variety of social, educational and family backgrounds. While they work in a new organizational system with different shift schedules, they may affect their working life in various ways (Ahasan et al., 1997; n.d.). Bangladesh entrepreneurs are also active by employing unskilled or semi-educated labourers in various shift systems (Ahasan, n.d.), and a high accumulation of fatigue was being recognized in some studies (Khaleque and Rahman, 1982; Khaleque and Rahman, 1984; Khaleque et al., 1988; Khaleque, 1990; Khaleque, 1991; Khaleque and Pervin, 1994; Khaleque and Hossain, 1994; Khaleque and Ahasan, 1997; Sharmin and Rahman, 1997). Fatigue, boredom, absenteeism, errors and accidents were also noted from shift work in the neighbouring countries (Mahathevan, 1982; Ong et al., 1987; Ong and Kogi, 1990; Chavalitsakulchai and Shahnava, 1990; Osiri et al., 1994; Kawakami et al., 1994; Chandrawanshi and Pati, 1996; Nag et al., 1997; Nag and Patel, 1998).

Shift work also affect both entrepreneurs and workers, concerning individual or local factors, social environment, and the working conditions. The effects of such problems, however, vary widely among the shift workers in different countries (Colquhoun, 1981), especially due to the intervening factors (e.g., eating habits, food intake, physical fitness, smoking habit, circadian phase, diurnal type, commuting or resting norms, sleeping patterns, and hypothermic effect, etc.). In relations to many of such intervening variables associated with shift work (Figure 1) exists in different countries is more or less common among shift workers, that might have a correlation with the workers' health, safety and wellbeing.

Shift work is being responsible for 20% of job opportunities in the developed nations (Kabaj, 1968). Twenty percent of all workers have to leave shift work in a very short time because of serious

disturbances; and only 10% of all workers do not complain about shift work during their working life (Maurice, 1975; Grandjean, 1981). The remaining withstand shift work with different levels of mal-adaptation and intolerance that can become more or less manifest in different times, and with different intensity, in terms of discomfort, troubles or disease (Kollar, 1983; Costa, 1996).

The problems caused by odd shift schedules are devastating not only in the developing countries, but also in the western nation in terms of social and economic consequences. There is no accurate figure available for such costs in regard to the developing countries, but it can be huge in terms of human suffering and production losses. As such, work-related problems in the industries due to employees inability to stay awake (or tiredness cost) is estimated to USD 50 billion per year in the United States alone (ANOHS, 1996). It is therefore important to find correlation between shift work and job-content, tasks, activities and operational demands. There is also a need to document the extent to which shift workers can have flexibility in their choices on working time so that it help them for participating in their social and family lives, as well as improve their efficiency and production.

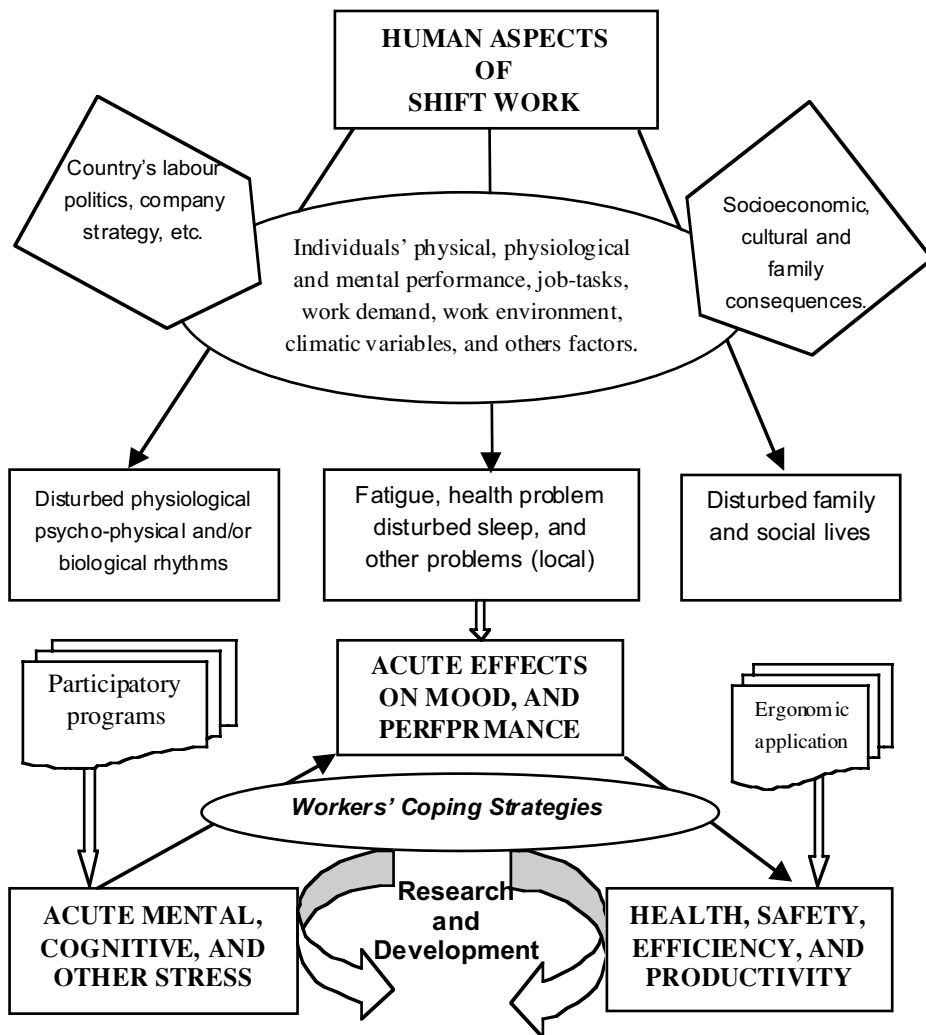


Fig. 1. A comprehensive model endorsing human aspects of shift work (Ahasan et al., n.d.).

## MATERIALS

### *Work place*

This study was conducted among the workers in a shoe factory in Dhaka, Bangladesh. The product, process and operation varied according to the nature of the tasks and jobs, which consisted partly of manual and partly of automatic process to make shoes by assembling the different parts. The workers were involved with cutting leather into pieces for different parts of shoes, preparation of soles, and designing and shaping the shoes while operating small machines and equipment.

### *Subjects*

The sample of the subjects comprised 60 adult male workers, selected randomly from three working sections such as cutting, soling and modelling section. In all, 49 (82%) workers were married and 11 (18%) were unmarried, having secondary school to college level education. The salary was paid monthly (USD 70–90). The workers also received fringe benefits such as religious festival bonus (e.g., *Eid*-bonus for the Muslims and *Durga Puja*-bonus for the Hindus), gratuity or provident funds, and other facilities but to a limited extent.

### *Shift schedule*

The subjects were working on a weekly rotating three-shift system. They worked eight hours in a day, and six days in a week (Saturday–Thursday) on a cycle of rotation followed by a day off on Friday, because of the day of Muslim prayer. As such, they worked in the first week on the morning shift (06:00–14:00), the second week on the afternoon shift (14:00–22:00), and the third week on the night shift (22:00–06:00). There was a half-hour break during each shift, however.

## METHODS

### *Measuring instruments*

The Job Attitude Questionnaire (Hoppock, 1935) was used in which the subjects were asked to choose five pre-coded answers [from "I like it very much" to "I dislike it very much"]. The Brayfield-Rothe Job Satisfaction Scale (Brayfield and Rothe, 1951) was used to measure overall job satisfaction. It consisted of 18 items, while the Likert scoring system was followed for both the positive and negative items on workers' attitudes on five categories of agreement-disagreement format [ranging from strongly agree (scale: 5) to strongly disagree (scale: 1)]. The lowest and highest possible total scores could be in between 18 and 90, respectively. A total score above the neutral point at 54 represents job satisfaction, and a score falling below this point represents job dissatisfaction. Khaleque (1979) reported a concurrent validity of 0.63 for this scale, while he conducted a case study in Bangladesh on the performance and job satisfaction in short-cycle repetitive work.

The Symptom and Feeling of Fatigue Scale (Kogi et al., 1970; Yoshitake, 1971) was considered to identify general and specific symptoms of fatigue. The Industrial Fatigue Committee of the Japanese Association of Industrial Health developed this scale. It consists of 16 items about general and specific bodily and mental symptoms of fatigue to which the subjects answered "yes" or "no". Kogi, Saito and Mitsuhashi (1970) have also provided evidence of validity of this scale. Yoshitake (1971) found a high correlation between the frequency of complaints of fatigue and the feeling of fatigue.

The Questionnaire for Specific Problems of Shift Work (Wedderburn, 1978) was used to identify health complaints, sleeping difficulties, perception of family and social life in shift-work, vis-à-vis their own particular schedule. It consisted of 10 items for assessing the subjects' attitudes toward some specific aspects of different types of shift work.

## RESULTS

The results showed that a significant number of the subjects disliked the shift system. In all,

73% of respondent disliked and 22% liked shift systems. Only 3% reported extreme negative attitudes, and complained that such a rotating shift caused potential risk to their working lives. The number of the subjects and percentage of their perceived attitudes according to their “likes” and “dislikes” of shift work is given below (Table 1).

Table 2 revealed the subjects’ opinion about the adverse effects of shift work that included problems in their personal, family and social lives. As such, shift work created disturbances of their family lives (75%), social lives (65%) and conjugal lives (72%). In all, 70% of the subjects opined that shift work created problems for their own family members, 71% had to curtail their time with family and friends, and 80% of them complained against the restricted scope of leisure time, who had difficulties to meet their relatives and friends due to insufficient off-days. Eighty three percent subjects suffered from health problems, 85% had sleep disturbances, and 78% experienced mealtime irregularities.

Table 3 revealed inter-individual variability among the subjects’ attitudes to and perceptions of shift work in terms of their satisfaction and dissatisfaction. A total of 26 subjects (43%) reported difficulties in their personal lives and social activities, according to the distribution patterns of shift workers in terms of their job satisfaction and dissatisfaction. The majority of respondents (57%) liked the other job components such as tasks-activity, wage, fringe benefits, job security, and labour-management relationships. Their opinions about disliking shift systems or rotating shift schedule were not significantly associated with the overall job dissatisfaction.

Table 1. Workers’ attitudes to their “likes” and “dislikes” on shift work (N= 60).

	Number of workers	Percentage (%)
I like it very much	0	0
I like it	13	22
I neither like it nor dislike	1	2
I dislike it	44	73
I dislike it very much	2	3
Total	60	100.0

Note:  $\chi^2 = 67.18, p < 0.001$

Table 2. The adverse effects of the subjects’ personal, family and social lives (N= 60).

	Yes (%)	No (%)
Does your work schedule disturb your family life?	75	25
Does shift work create problems for your family members?	70	30
Does shift work disturb your conjugal life?	72	28
Does the work schedule curtail your leisure activities?	71	29
Does shift work create difficulties for meeting your friends?	80	20
Does shift work restrict your social life?	65	35
Does shift work disturb regularity of your mealtime?	78	22
Does shift work disturb your sleep?	85	15
Does shift work affect your health?	83	17

Table 3. Workers' perceived attitude in terms of satisfaction and dissatisfaction (N= 60).

Satisfied	Dissatisfied	$\chi^2$	p
34	26	1.06	not significant

## DISCUSSION

While a person works in various types of shift systems, it is very difficult to predict real problems, especially on what variables, and how workers' fatigue level mediate from individual's psychosocial and cognitive capacity. However though some research have been conducted, there has been no systematic or empirical test or survey yet available in the literature to match or adjust with the dexterity and individual's capacity of shift workers in Bangladesh. It is therefore important to evaluate intervening factors to see how social and family items mediate through the work-strain relationship, and how shift schedules affect workers in coping with different shift schedules. It is also necessary to evaluate human aspects of shift work to identify how disruption or disturbances of shift workers in their circadian rhythms affect them in different cycle or rotation. Since the management of many industries does not usually follow such a system that suits workers' psycho-social well being, it is very difficult to implement standard or local measures (Ahasan et al., n.d.) even it is suggested for the improvement of working lives.

The results in this paper identified that such a rotating type of shift work caused many problems for the employees, and negatively affected their health, safety and well being. The authors believed that the reason of such problems/dissatisfaction was due to non-participation of the workers in practising the alternative schedule (Ahasan, n.d.; Ahasan et al., n.d.). Rotating shift-schedules, again, pose less potential risk to non-satisfaction, as the subjects interviewed in this study were somehow satisfied with an adequate Manning of the organizational structure; salary, fringe benefits, overtime payment, etc. The overall tendency to the positive aspects on a favourable relation with the management may not outweigh the negative aspects of workers' psychosocial and other problems. The authors believe that workers, in general, do have many problems in Bangladesh, resulting in overall dissatisfaction of the workers, in most of the cases. Hence the positive aspects do not necessarily lead to their job dissatisfaction. The authors also believe that respondents perhaps lied, may be partially, on the issue that they were satisfied with the labour-management relationship, and salary or fringe benefits. This lie (i.e., error in the results) may be based on the local situation and bias their true response due to job scarcity, and because they did not want to leave their job for fear of becoming unemployed, or other pressure in the economy. However, it seems that shift work was not equally acceptable or unacceptable to all the shoe factory workers. Though a greater number of subjects disliked the shift system, in general. The shift work is not really associated with pronounced fatigue effects because a direct mechanism seem to be related to the job satisfaction that was evident on some aspects. It is therefore unreasonable to define people "unfit" for shift work systems, for instance. It can be economical losses for many entrepreneurs in Bangladesh. The restriction of shift work, again, should not be considered as the strategy for removing some of the difficulties of workers—as it might increase labour union's awareness and hamper production that will surely be economic loss for the entrepreneurs. It has been a usual habit in Bangladesh that labour unions often call for strikes for many demands that do not give benefits to both workers and entrepreneurs, whether general workers are deprived of from facilities that strikes were called for. In many cases, union leaders take bribes from the entrepreneurs. By the active participation and co-operation of all the parties concern. The shift workers need to be acquainted with a new organizational system and with different shift schedules so that it enhances more job satisfaction. A proper measure should be launched for the improvement of workers' health, safety and well being, as well as efficiency and production.

## CONCLUSION

It was difficult to investigate what features of different schedules can help both workers and entrepreneurs, and predict how workers' circadian structure and shift schedule could be synchronized with the reconciliation of socio-cultural and working life. It is especially noticeable when the shift workers may not have social environment, or days off, in some situations. In this study, perceived fatigue was not compared among the subjects in different working sections, and in different shifts. The time to adapt the circadian rhythm and a rating of adaptation to different shift schedules were neither monitored nor investigated which were important to observe their physical and cognitive variation, as well as the differences of the level of mental fatigue. Some of the unidentified factors due to unfavourable sequences within a shift system (that existed in the shoe factory) allowed errors that our results are not supposed to be very accurate. It would minimize errors if causal relationships between adaptation to shift work and fatigue levels are identified. Since physical, physiological, neurological, cognitive or psychomotor performances of shift workers were ignored in this study, irregularity of their psychosocial life and work patterns remains ambiguous, and those were suspected mainly due to rotating shift or changing schedules. It was also difficult to make a final conclusion since work-related and psycho-physical data were missing in this study that would show exposure times be efficient. A more comprehensive research, nevertheless, is necessary to evaluate shift work and assess work exposures. It is of vital importance to design a suitable shift schedule that will enhance workers' health, safety and well being.

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