Original Research Article

Effect of yogic intervention on urinary melondialdehyde levels, autonomic functions and quality of life among buffing polishing workers of an automobile industry

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Abstract

Background: Oxidative stress at industry setting poses a threat to autonomic functions and quality of life deterioration of the workers in automobile industry. Yogic intervention may improve the stress levels and autonomic functions thereby improves their quality of life. **Aims and Objectives:** This study was aimed to see the effect of 12 weeks of yogic regimen on urinary melondialdehyde levels (MDA), autonomic functions and quality of life in workers exposed to buffing polishing work in an automobile industry. **Materials and Methods:** 35 male subjects of age group 25-40 years working on buffing polishing machine for 4-6 hours/day, 6 days in a week for the last 2 years were selected as subjects from an automobile industry. Same number of age and sex matched controls not involved in buffing polishing work were also selected from the same socioeconomic background. Urinary MDA levels, autonomic functions and health related quality of life parameters were recorded before and after 12 weeks of practicing yogic regimen. All the parameters were analyzed intergroup as well as intra-group by 2 way ANOVA followed by the Tukey's Test. **Results:** Significant improvement was found in MDA levels, weight, BMI, E:I ratio & cold pressor test of autonomic function tests and all the physical and psychological domains of quality of life after practicing 12 weeks of yoga regimen. **Conclusions:** Integrated yogic regimen in buffing polishing workers can improve stress markers thereby improving their autonomic functions and health related quality of life. Thus yoga and pranayama can be encouraged and incorporated as a part of their routine schedule.

Key words: Buffing polishing workers, autonomic functions, urinary melondialdehyde, quality of life, yoga

Introduction

Occupational neurotoxic diseases have become increasingly common world-wide due to rampant industrialization. Workers in industry may suffer from a wide range of transient or permanent neurological manifestations like cognitive dysfunction, cerebellar ataxia, parkinsonism, sensorimotor neuropathy, autonomic dysfunction and neuromuscular junction disorders[1]. Because of high metabolic rate, nervous system is highly vulnerable to the toxic agents released during different processes in automobile industry. Buffing and polishing are two finishing processes that are used in automobile industries for smoothing a metal surface using an abrasive and a leather strap. The abrasive used in these processes is either aluminium oxide or silicon carbide. These metals can cause oxidative stress by increasing the formation of reactive oxygen species (ROS) or by diminishing the antioxidant enzymes[2]. Oxidative stress generally causes damage to the membrane polyunsaturated fatty acids leading to the generation of melondialdehyde (MDA), a thiobarbituric acid reacting substance which can easily be detected in the urine. MDA is the breakdown product of the major chain reactions leading to definite oxidation of polyunsaturated fatty acids, such as linoleic and linolenic acids, and thus, serves as a reliable marker of lipid peroxidation[3]. A number of animal and human studies have suggested the role of oxidative stress in the development of autonomic neuropathy in the form of cardio-vagal modulation in diabetic patients, pre-hypertensive patients and in chronic kidney disease patients but its hazardous effects in automobile industry workers have not been studied[4-6].

It has been documented by various researchers that work place stress in industries can also impair the quality of life (QOL) of a person by affecting his physical, emotional and social domains[7-9]. It is a topic of discussion in the world, but research has given limited insight into the health-related QOL of automobile buffing polishing workers. Today, there is considerable interest among the management practitioners and researchers with regard to the role and benefits of introducing spirituality at the workplace. The Harvard Business School study, drawn over a period of 11 years, showed a marked relationship between the strength of the organization's corporate culture and its profitability[10]. Lloyd also found that the organizations where workplace spirituality was maintained, they outperform those without it by 86%[11].

Yoga is a mind-body technique, which combines a set of physical exercises (asana) in sync with breathing techniques (pranayama), relaxation and meditation. Yoga induced elevated SOD level has been found to prevent formation of peroxynitrite and thus reduces possibility of nitrosative stress which may help to cope with deleterious effects of oxidative stress and prevent further damage[12,13]. It leads to an inhibition of the posterior or sympathetic area of the hypothalamus which optimizes the body's sympathetic responses to stressful stimuli and restores autonomic regulatory reflex mechanisms associated with stress[14]. Yogic practices inhibit the areas responsible for fear, aggressiveness and rage, and stimulate the rewarding pleasure centers in the median forebrain and other areas leading to a state of bliss and pleasure. This inhibition results in lower anxiety, heart rate, respiratory rate, blood pressure, cardiac output and blood sugar[15,16].

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Yoga is an effective method for improving quality of life in addition to the prevention and management of diseases[17,18]. Regular yoga practice may lead to changes in life perspective, self-awareness and improved sense of energy to live life fully & with genuine enjoyment[19]. It creates a sense of well-being, feelings of relaxation, improved self-confidence, improved efficiency, increased attentiveness, lowered irritability, and an optimistic outlook on life[20-22]. Yoga, with its holistic approach to improve overall quality of life, offers several self regulatory practices that aim to correct physiological and psychological factors that contribute to low QOL[23].

Plenty of literature is available on the benefits of yoga in normal subjects as well as in various systemic disease conditions but effects of yoga in industrial workers especially in buffing polishing workers have not been studied much. The beneficial effects of yoga can be extended to buffing polishing workers of automobile industry to improve their multidimensional QOL, oxidative stress and autonomic functions. Therefore this study was planned to observe whether inclusion ofan integrated yoga based regimen in daily routine of buffing polishing workers of automobile industry can modify their oxidative stress, autonomic functions and overall quality of life.

Material and methods

Selection of subjects

A total of 42 people were approached in a buffing polishing unit of automobile industry of Mayapuri industrial area and 35 agreed to be a part of this study. Only male workers belonging to the age group 25-40 years, exposed to buffing polishing machines for 4-6 hours/day and 5-6 days/week for the last 2 years or more were selected as subjects. Any person suffering from acute or chronic infections like tuberculosis, chronic obstructive pulmonary disease, hypertension, diabetes mellitus or having a history of smoking or alcoholism were excluded from the study. 35 age and sex matched healthy subjectcontrols were also selected from the same socio-economical background but not involved in industry. Exclusion criteria for controls were same as that for subjects. All the subjects and controls were explained about the study in detail and informed consent was obtained from them.

Study design

This was a prospective observational case control study where the effect of yoga was observed on urinary melondialdehyde levels, autonomic function tests and quality of life in buffing polishing workers. This study was conducted in the Department of Physiology, UCMS and GTB Hospital, Shahdara, Delhi. The ethical clearance was obtained from the Ethical Committee of the institution before starting the study and written consent from each subject was taken before recruiting them in the study. All the subjects and controls underwent complete physical and clinical assessment. Anthropometric parameters like Height, weight, Body mass index (BMI) were recorded. Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), and mean blood pressure (MBP) were also recorded in both the groups.

Blinding and masking

As this was an interventional study, double blinding was not possible. Here, the statistician and data analyst were blinded to the intervention status of the patients.

Intervention for the study group

All the subjects performed yogic exercises at the industry setup itself for 45 min per day for 12 weeks under the supervision and guidance of a yoga expert trained from Central Council of research in Yoga and naturopathy, New Delhi. The yogic regimen which was followed included breathing exercises (pranayama), asanas and relaxation techniques (details are given in Table-1). A room was arranged at the industry setup itself where these subjects underwent yogic practices so that they don't have to travel to some other place or they miss out on their wages. Drop-out rate was also taken care of by this way and no subject in the test group missed his yoga session. They were called to the institute only twice for the recordings before and after the intervention (12 weeks).

Table 1: Yoga regimen followed by the Test Group subjects

Total duration of Asanas, deep breathing techniques and relaxation techniques: 45 min

Pranayama: 20 minutes

1. Bhastrika: 2 min
2. Kapalbhati : 8 min
3. Anulom-Vilom: 10 min

Asanas: 20 minutes

1. Tadasana- 2 times
2. Trikonasana- 2 times
3. Mandukasana- 3 times
4. Pavanmuktanasana- 3 times
5. Bhujangasana- 3 times

Ralaxation in Shavasana: 5 minutes

Intervention for the control group

Subjects in the control group did not undergo any yogic intervention and continued their daily routine activities.

Test procedure

The parameters assessed in both the groups before and after 12 weeks of intervention were:

1. **The melondialdehyde level:** The subjects were asked to collect 10 ml of first voiding sample of their urine in the sterilized vials provided to them. Enzyme-linked immunosorbent assay (ELISA) Kit of 96 wells from M/s Immunoconcept India was used for in vitro quantitative determination of human MDA in urine. Standards and samples are aspirated and poured into the wells. Human MDA present in the sample binds to the pre-coated human MDA monoclonal immobilized antibodies. With the help of fluorescence or ultraviolet detectors, picomole quantities of MDA were detected in urine samples.
2. **Autonomic function tests:** Autonomic function tests were carried out in the cardio-respiratory lab of our department by using BIOPACK SYSTEMS MP-36. The Software used was AcqKnowledge 4.1 and data acquisition was set at the sampling rate of 1000HZ. For recording signals, the MP-36 unit is connected to the computer via a USB port, electrodes, transducers, and I/O devices. Lead II ECG was recorded by using SS2L electrode which was connected to channel 1 to calculate heart rate variability (HRV). For recording respiratory rate and depth of breathing, SS5LB transducer is used which was connected to channel 2. Handgrip dynamometer, BP apparatus and cold water were also arranged.

The various autonomic function tests performed and parameters recorded as per the categorization of Ewing's battery of tests[23]were:

1. HRV during Deep breathing /Delta heart rate (bpm)
2. E:I ratio
3. Lying to standing test: 30:15 ratio
4. Sustained hand grip test: Change in diastolic blood pressure (mmHg)
5. Cold Pressor Test: Change in diastolic blood pressure (mmHg)

1. **HRV during Deep breathing:** The subject was instructed to sit quietly and to breath smoothly, slowly& deeply at 6 breaths/min. (5 seconds of inspiration and 5 seconds of expiration), a rate which produces maximum variation of heart rate. Heart rate variability was measured from lead II ECG. Delta Heart Rate was calculated as the difference between maximal and minimal heart rate during inspiration and expiration respectively, averaged for 6 cycles.
2. **E:I ratio:** From the lead II ECG, the ratio of longest R-R interval and shortest R-R interval, averaged over 6 cycles was considered as E:I ratio.
3. **Lying to standing test (LST):** After 10 min of supine rest, the subject was told to stand immediately and BP & heart rate were

recorded at baseline and after 2 min. 30:15 ratio was calculated as the ratio between longest R-R interval at or around the 30th beat and shortest R-R interval at or around the 15th beat

4. **Sustained handgrip test (SHG):** The baseline blood pressure (BP) was recorded in the subject. Then, he was asked to hold the handgrip dynamometer using maximum force with his dominant hand for a few seconds. The procedure was repeated thrice and the maximum value of the 3 readings was considered as his maximal voluntary contraction (MVC). The subject was then instructed to maintain the grip on the dynamometer at 30% of MVC for 4 min. BP was measured on the contra-lateral arm at 1st, 2nd, and 4th min. Change in diastolic BP (DBP) was calculated by subtracting the baseline diastolic BP from the highest diastolic BP during the test.
5. **Cold Pressor Test (CPT):** The baseline BP of the subject was recorded. The subject was then advised to immerse his hand upto the wrist in cold water of temperature 10°C for 1 min. The BP was taken just before the hand was taken out of the water when he no longer can withstand immersion of his hand in cold water. Change in diastolic BP was calculated by subtracting the baseline diastolic BP from the highest diastolic BP during the test.

Heart rate variability during deep breathing, E: I ratio, 30:15 ratio were taken as tests of parasympathetic nervous system (PNS) reactivity. Change in DBP during sustained hand grip, Change in DBP during Cold pressor test and postural drop in BP after 2 min of standing were taken as tests of sympathetic nervous system (SNS) reactivity.

Assessment of quality of life

For quality of life we used the WHOQOL-BREF questionnaire (Hindi version) which is a 26-item version of the WHOQOL-100 assessment. Analysis of internal consistency, item-total correlations, discriminate validity and construct validity through confirmatory factor analysis, indicate that the WHOQOL-BREF has good to excellent psychometric properties of reliability and performs well in preliminary tests of validity. These results indicate that overall, the WHOQOL-BREF is a sound, cross-culturally valid assessment of QOL, as reflected by its four domains: physical, psychological, social and environment.

Statistical analysis

The data was analyzed intragroup as well as intergroup by using SPSS-24 (Statistical Package for the Social Sciences) for statistical analysis. Parameters of AFTs, Urinary malondialdehyde levels (for oxidative stress) & domains of WHOQOL BREF (Hindi Version) were compared by using repeated measures ANOVA followed by Tukey's test. Significance was considered when $P \leq 0.05$.

Results

The values of anthropometric parameters like weight and BMI of the subjects were more or less equal to that of controls at the onset of our study and there was a significant reduction in these after following 12 weeks of yogic regimen (Table:2). The MDA level of the subjects was also significantly higher at the onset of study and that remained higher even after 12 weeks of yogic intervention as compared to controls but on intragroup comparison a significant improvement in MDA level was seen (Table:2). It implies that yoga intervention has improved their oxidative stress markedly.

Table 2: Comparison of Urinary Melondialdehyde levels and anthropometric parameters in Test Group and Control group before and after yogic intervention

	Baseline (Mean± SD)		After 12 weeks (Mean± SD)		*p value		Significance (Tukey's test)	
	Test Group (n= 50)	Control Group (n=50)	Test Group (n= 50)	Control Group (n=50)	Between Groups	Within Group	Between Groups	Within Groups
Urinary MDA levels	3.92±1.198	2.85±1.102	3.73±0.948	2.86±0.947	0.0001*	0.250	Sig between groups before as well as after yoga	NS within groups at baseline as well as after intervention
Weight	67.37±4.181	67.83±5.484	65.20±3.818	68.30±5.134	0.133	0.012*	NS between groups before and after yoga	Sig in Test group after yoga, NS in control group
Basal metabolic index (BMI)	24.20±1.261	24.09±1.726	23.43±1.156	24.27±1.672	0.315	0.015*	NS between groups before and after yoga	Sig in Test group after yoga, NS in control group

Sig: Significant, NS: Non Significant

Autonomic function test parameters also showed improvement after practicing 12 weeks of yogic regimen in subjects (Table:3).

Table 3: comparison of AFT parameters in Test Group and Control group before and after yogic intervention

	Baseline (Mean± SD)		After 12 weeks (Mean± SD)		*p value		Significance (Tukey's test)	
	Test Group (n= 50)	Control Group (n=50)	Test Group (n= 50)	Control Group (n=50)	Between Groups	Within Groups	Between Groups	Within Groups
HRV (beats/min)	18.53±1.961	18.50±1.978	18.77±1.251	18.07±1.856	0.326	0.717	NS between groups before and after yoga	NS within groups before and after yoga
Deep Breathing Test (E:I ratio)	1.27±0.030	1.29±0.062	1.30±0.038	1.26±0.063	0.039*	0.705	Sig between groups after yoga but NS at baseline	NS within groups before and after yoga
LST (30:15 ratio)	1.18±0.039	1.19±0.110	1.20±0.089	1.19±0.095	0.791	0.146	NS between groups before and after yoga	NS within groups before and after yoga

SHG (DBP change) (mm/Hg)	18.47±2.738	17.40±2.848	17.97±2.251	17.97±2.671	0.173	0.932	NS between groups before and after yoga	NS within groups before and after yoga
CPT (DBP change) (mm/Hg)	14.97±2.697	13.43±2.825	14.17±1.599	14.00±1.682	0.065*	0.681	Sig between groups at baseline and NS after yoga	NS within groups before and after yoga

HRV: Heart rate variability, LST: Lying to standing, SHG: Sustained hand grip, CPT: Cold pressor test
Sig: Significant, NS: Non Significant

The E:I ratio of the subjects was at par to that of the control group at the onset of study which increased significantly after 12 weeks of yoga and it came out to be even better than that of the control group. This indicates that parasympathetic reactivity increased in subjects after following the yoga regimen. The CPT value of the subjects was also significantly higher than that of the control group at the onset of the study but after following yogic regimen, there was a significant decrease in their CPT value and it came at par to that of the control group indicating decreased sympathetic reactivity. Other parameters of autonomic function tests like HRV during DBT, LST and SHG also showed improvement in our subjects after 12 weeks of yogic intervention although they were statistically non significant

Table:4 shows that at the onset of study, different domains of quality of life like Overall score, Physical domain score and Psychological domain score were significantly lower than that of the control group but after 12 weeks of yoga there was an improvement in these scores and the difference between subjects and controls became non-significant. However within the test group and control group the change remained non-significant.

Table-4: Comparison of Quality of life (WHO QOL –BREF Scores) in Test Group and Control group before and after yogic intervention

	Baseline (Mean± SD)		**After 12 weeks (Mean± SD)**		***p value**		**Significance (Tukey's test)**	
	Test Group (n= 50)	**Control Group (n=50)**	**Test Group (n= 50)**	**Control Group (n=50)**	**Between Groups**	**Within Groups**	**Between Groups**	**Within Groups**
Overall Scores	41.25±15.096	53.33±12.253	48.32±12.145	51.25±10.038	0.010*	0.120	Sig between groups at baseline and NS after yoga	NS within groups before and after yoga
Physical Domain	45.35±6.643	49.87±6.042	47.49±6.509	49.04±5.624	0.026*	0.472	Sig between groups at baseline and NS after yoga	NS within groups before and after yoga
Psychological Domain	45.07±8.121	51.52±7.046	47.91±6.806	53.74±7.529	0.000*	0.023*	Sig between groups at baseline as well as after yoga	Sig in Test group after yoga, NS in control group
Environmental Domain	43.64±6.640	45.30±5.705	47.08±5.119	44.61±4.767	0.744	0.080	NS between groups before and after yoga	NS within groups before and after yoga
Social Domain	41.66±11.371	46.38±13.433	44.72±10.604	45.55±12.132	0.288	0.508	NS between groups before and after yoga	NS within groups before and after yoga

Sig: Significant, NS: Non Significant

Discussion

Buffing and polishing workers of automobile industry are vulnerable to different types of stress in their working environment. In the present study, their oxidative, psychological and physical stresses were analyzed by urinary MDA levels, autonomic function tests and different domains of quality of life respectively. There are very few studies who studied different aspects of stress levels in automobile workers and almost none who studied the role of yogic regimen on their oxidative & psychological stress levels, overall health and performance.

In our study the buffing polishing workers of automobile industry were subjected to a fixed yogic regimen for 12 weeks and they showed a significant improvement in their anthropometric parameters like body weight and Body Mass Index (BMI). This is in accordance with previous studies performed in normal healthy people by various researchers in the past[25,26]. Shinde N et al. compared the effects of yoga & aerobic exercises on BMI and observed yoga more beneficial as compared to aerobic exercises[27].

In the present study, the value of urinary MDA was found to be significantly higher in our subjects as compared to controls at the onset of study. This is in accordance with previous studies performed on industrial workers which inferred that different types of metals can cause oxidative stress by increasing the formation of reactive oxygen species (ROS) or by diminishing antioxidant enzymes[2,28]. An increase in the production of reactive oxygen species (ROS) such as superoxide radicals can be responsible for lipid peroxidation which propagates chain reaction further and causes DNA damage thereby generating cytotoxic products like malondialdehyde and 8-hydroxy-2-deoxyguanosine, both are easily detected in urine[3,28]. In our study the higher MDA level indicated that metal dust could be a potential cause of oxidative stress in buffing polishing workers. After 12 weeks of yoga there was a significant improvement in their oxidative stress levels implied by reduced urinary MDA. However, the value still remained higher as compared to the control group which indicates that the extent of damage done by metal nano particles is much more in workers and 12 weeks of yogic regimen may not be sufficient to

bring a marked improvement in their MDA level. Yogic exercise may induce upregulation of superoxide dismutase and down regulation of NADPH oxidase and can lead to reduction in lipoperoxidation thereby decreasing the oxidative stress as indicated in previous studies[12,29,30].

At the onset of our study, the various parameters of autonomic function tests like HRV during deep breathing, E:I ratio, 30:15 ratio, Sustained Hand Grip Test (SHG) were in normal range in subjects as well as in controls except the Cold Pressor Test (CPT) which was significantly higher in subjects. This can be said that sympathetic reactivity is more in buffing polishing workers as compared to normal controls. Other parameters of autonomic function tests were not found to be markedly deranged which either may be due to low concentration of metal dust in buffing polishing units or due to less duration of exposure but some degree of derangement of autonomic functions was there as compared to non exposed people. We came across very few research papers that investigated autonomic functions in automobile industry workers. Though, there are researchers that studied metal-rich occupational particulate exposures in terms of hard metal dust but they studied only 1 parameter i.e. HRV[31]. In our study we incorporated 5 parameters of autonomic function tests- HRV, E: I ratio, 30:15 ratio, Sustained Hand Grip Test (SHG) and Cold Pressor Test (CPT). In our subjects, 12 weeks of yoga training significantly improved the values of E: I ratio which implies that parasympathetic reactivity increases in workers after practicing yoga. Other parameters like HRV, 30:15 ratio also showed a non-significant increase in values whereas SHG and CPT showed a decrease in values. From the results we can infer that there was a trend of increase in parasympathetic activity and decrease in sympathetic activity following yogic regimen for 12 weeks in buffing polishing workers. These results are in accordance with the observations of the autonomic function studies performed in healthy individuals as well as in diseased population who concluded that yoga therapy enhanced the vagal tone and decreased the sympathetic drive, hence improving the cardiac autonomic balance[32,33]. Previous studies have shown significant improvement in 30:15 ratio, E:I ratio, and DBP response in the hand grip and cold pressor test in subjects practicing slow breathing exercises[34-36]. It was found that brief yoga-based relaxation training normalizes the function of the autonomic nervous system by deviating both sympathetic and parasympathetic indices toward more "normal" middle region of the reference values[37].

In this study, we assessed the quality of life of these automobile industry workers by using WHOQOL-BREF. It is a standardized comprehensive instrument developed by the WHO for assessing quality of life under five domains: physical health, psychological health, social relationships, environmental health and overall quality of life. At the onset of study the values for all the 5 domains of WHOQOL-BREF were lower in buffing polishing workers as compared to the normal controls. Also, in 3 out of 5 domains (overall quality of life, physical health and psychological health) the reduction in quality of life of test group was significant.

Previous researchers have evaluated quality of life in various industry workers including automobile industry but not in buffing polishing workers. Yu HM et al.and Edimansyah et al studied WHOQOL-BREF in coal dust workers and found significant worsening of all functional domains of WHOQOL-BREF except for psychological health[7,8]. Chattopadhyay K et al. explored HRQOL in coal-based sponge iron plant workers in west Bengal and identified derangements but the effect of any intervention like yoga hasn't been studied in buffing polishing workers of automobile industry[9]. In the present study after 12 weeks of yoga we found an improvement in all the 5 domains of quality of life indicating the positive effect of yoga on overall well being. The improvement was to such an extent that in 2 out of 3 domains (overall quality of life and physical health) where the reduction in quality of life was significant has improved to a level that the difference became insignificant to that of controls. However, in the third domain (psychological domain) even after significant improvement post yoga, the difference remained insignificant implying that 12 weeks of yoga may have been insufficient to produce a significant improvement in their psychological level.

Various previous studies have also found that regular yoga practice lead to important manifestations such as change in life perspective, self-awareness and an improved sense of energy. It encourages one to relax, slow the breath and focus on the present, shifting the balance from the sympathetic nervous system to the parasympathetic system[37]. Bhat PS et al. studied psychological benefits of yoga in industrial workers and found that yoga had more beneficial psychological effect comparable to physical training[38]. Till date there are very few studies that investigated the effect of yoga on quality of life of automobile industry workers.

From the findings of our study we conclude that yoga can be included in the day to day routine of industry workers to remove their physical and emotional stresses and to improve their overall well being at their workplace.

Strengths of the study

Research is still lacking in Industry workers specially in buffing polishing workers even though the health of workers is a topic of concern in organizations. Different types of physical and emotional stresses and the measures to reduce them have not been studied much. In our study we included yoga - our ancient way of life to reduce their oxidative and emotional stresses and to improve their overall quality and life. This could be first study to introduce yoga in buffing polishing workers at their workplace itself.

Limitations of the study

The study was unable to correlate metal dust concentration in air to the extent of derangement in parameters assessed. The study design did not include metal concentration in blood so no correlation could be drawn between body concentration and deranged parameters. The study was on a small sample size. Better results would have been obtained with a larger sample size. In our study, 12 weeks of yoga regimen was not able to produce a significant improvement in their MDA levels, some parameters of autonomic functions so we can plan to engage them in long duration of yoga training at their workplace so that better sustainable effects can be obtained.

Recommendations

There should be periodic physical as well as psychological examination of the workers at the industrial workplace so that their problems can be resolved at the earliest. Holistic approach of yoga and pranayama can be introduced in their daily routine

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