STUDY TO ASSESS THE RELATIONSHIP BETWEEN WORKING IN SHIFTS ON THE PHYSICAL AND PSYCHOLOGICAL HEALTH OF THE EMPLOYEES IN A MULTINATIONAL COMPANY, BENGALURU, INDIA

Internship Training
at
ABC Consulting Pvt. Ltd., Bengaluru, India

By
Raghavi Mittal

Under the guidance of
Dr. Neetu Purohit

MBA Hospital & Health Management
2013–15

Institute of Health Management Research
Jaipur
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Internship Training

At

ABC Consulting Private Limited,

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On

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Masters in Business Administration in Hospital and Health Management

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(WHO Collaborating Centre for District Health System Based on Primary Health Care)

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The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements. I wish her all success in all her future endeavors.

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For Deloitte Consulting India Pvt. Ltd.

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This is to certify that the dissertation titled "**A study to assess the impact of working in shift on the physical and psychological health of the employees in a Multinational Company, Bengaluru, India**" submitted by **Dr Raghavi Mittal**, Enrollment No. IIHMR/PGDHM/2013-15/1483 under the supervision of **Neetu Purohit** for award of MBA Hospital and Health Management of the university carried out during the period from **9th February, 2015 to 15th May, 2015**. Embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Raghavi Mittal 18/5/2015

Signature

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To assess the relationship between working in shifts on the physical and psychological health of the employees in a Multinational Company, Bengaluru, India.

ABSTRACT

Author Name: Dr. Raghavi Mittal

Keywords : Health, Physical Health, Psychological Health, Shifts, Multinational Company.

Introduction:

According to the ILO (1990), working in shifts is "a method of organization of working time in which workers succeed one another at the workplace so that the establishment can operate longer than the hours of work of individual workers" at different daily and night hours. Within the broad category of shift work, we can make a distinction between a fixed shift system and a rotating one.Working in the shifts predisposes the individuals towards the various side effects of work hour timings. Hence a study was thus conducted at a multinational company located at Bengaluru, India for a project which required the employees to work in an evening shift for a US based client.

Objective:

- To assess if there is an impact of the shift timings on the physical health of employees currently working for the 'X Project' at ABC Consulting, Bengaluru, India.

- To assess an impact of shift timings on the psychological health of the employees working in the 'X Project' using a standard DAS21 scale.

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Methodology:

The study period for the research study was from Feburary,2015 to April 2015. The sample population was of one fifty employees out of which fifty were chosen through simple random sampling. It was an analytical type of study design wherein a detailed questionnaire was prepared to assess the physical health of the employees and a standard scale called DAS21 scale was utilized for assessing the psychological health of the employees. For ascertaining the relationship between the timings and the study groups t- test was applied at various places and the results were concluded.

. **Results:**

It was found that there is a relationship of the timings on the physical health but not on the overall psychological health of the employees

Conclusion and Recommendation

The following elements incorporated as a part of work culture has helped the Organization to be committed towards its people and hence is rated amongst the Top companies of the world to work for:-

- Individual based work system management.
- Complimentary offs for the employees devoting extra hours towards work commitments.
- Regular psychological counseling sessions.
- Introduction of 'My team' groups where the employees can share their own experiences and difficulties encountered during working.
- Introduction of an internal networking system which can allow the employees to directly approach the leadership.
- Continuous involvement of the leadership with the individuals working with the project to motivate and praise their accomplishments.

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ACKNOWLEDGEMENT

It is my proud privilege to express my sincere gratitude and appreciation to my respected guide and mentor Mr. Uday Kamat, Manager for the eminent organization that I have been recruited for his utmost guidance and help throughout the study. His untiring inspiration, keen interest, unfailing patience, valuable suggestions, painstaking supervision has inspired me to complete this dissertation. In this complete process I have imbibed values to carry on work with zeal and knowledge.I take this opportunity to express my sincere thanks to my team lead Deepika Sharma ,my guide at Sabu Bose, my mentor at college Neetu Purohit , Associate Professor, The Institute of Health Management Research, Jaipur, Dr.Ashok Kaushik, Dean Academics and Student Affairs ,Institute of Health Management Research, Jaipur for their constant help and encouragement to carry out the study.I would further like to thank my senior managers Arnab Chaudhary and Phani Kumar Rallabandi to provide me with this valuable opportunity to carry out the study in this project.I will be failing in my duty if I do not thank my team members Nagraj, my buddy Ishita Sood, Vijay Harish, Rohit Joshi, Bhargavi, Meghna, Shweta Soni ,Ashish Iyengar and Shreya Shetty for providing me with valuable required information, help and constant support during the study period.Finally I would like to thank my family and friends for providing me their untiring cooperation and prayers for my success. I would also like to thank all those who inspired and helped me in their own ways, whom I could not thank personally and whose names I am unable to mention herein.

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ABBREVIATIONS

*X Project –Project on which currently holding the position.

The names cannot be cited as per client requirement.

IHMR- Institute of Health Management Research University, Jaipur

ODC-Offshore Development Centre

MNC- Multinational Company

AMS- Application Management System

SCN- Supra chiasmatic Nucleus

US- The United States of America

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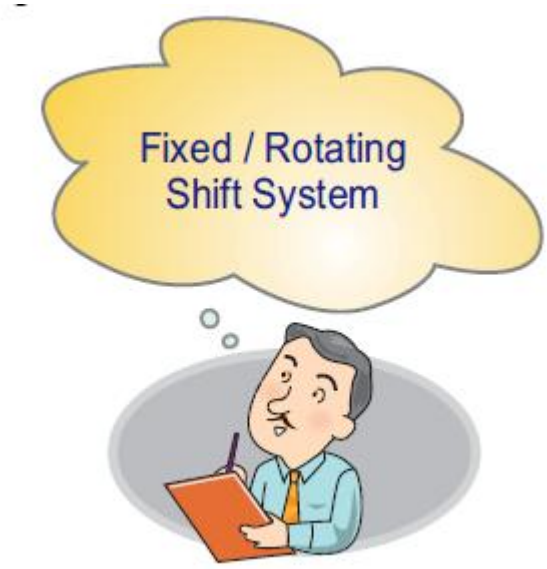
SECTION A : INTRODUCTION



Shift work is a necessary part of modern life. Institutions like hospitals, ambulance services, the police, the transport industry and many factories could not function effectively without it. Shift-work, however, comes with a price — the effects of being awake, when the cycle of days and nights tell us we should be asleep.

The disruptions of this "circadian rhythm", leads to fatigue.

Our circadian rhythm basically keeps the body in tune with daylight and night time hours. We have a natural inclination to be active during daylight hours and to rest and sleep at night when it is dark. The body clock is resistant to changes in this natural order of things. This is a reason why many find it hard to sleep during daylight hours after a night shift. If people go without sleep for long enough it eventually becomes impossible to stop them taking micro sleeps ("nodding off") of which they are quite unaware. The resulting impairment — being unable to carry

on working safely because of fatigue — has obvious implications for workplace safety.

There are many different types of shift work, with variations in shift duration, number of shifts, shift rotation, rest periods between shifts and days off. Within this broad category of working, we can make a specific distinction between a fixed shift system and a rotating one.

Under a fixed shift system, working time can be organized in two or three shifts: the early, late and/ or night shifts. This means that one group of workers might work during the morning and early afternoon; another group will work during the late afternoon and evening; and the third group (in a three-shift system) will work during the night.

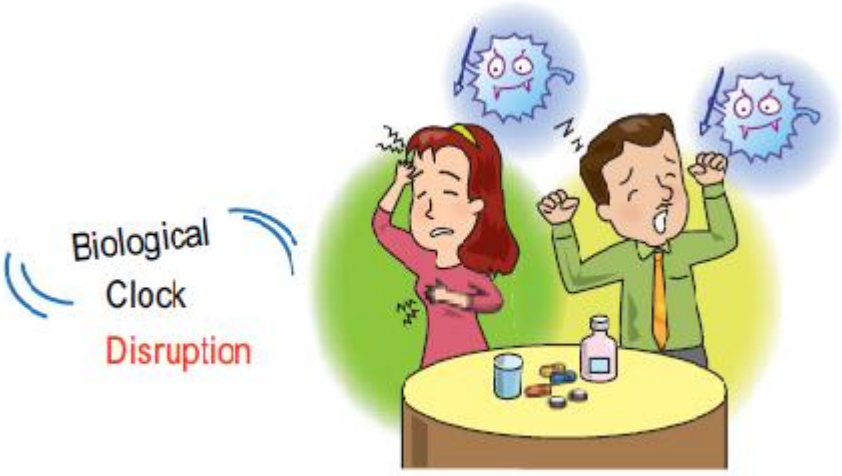
Under a rotating shift system, workers might be assigned to work shifts that vary regularly over time; these are called "rotating shifts" because they rotate around the clock (e.g. from a shift in the morning, to one in the afternoon, to one at night). If the firm's equipment is running nonstop the whole week, we can speak of "continuous" shift work with 24 hours of work, seven days a week (i.e. 168 hours of firm operating time). There is a virtually unlimited number of potential shift work patterns

The design of a particular shift pattern is a science in itself and will depend on many factors including business needs and the type of work being undertaken.

As with other workplace hazards, the most important thing is to carry out a risk assessment and implement control measures to minimize any possible adverse effects arising from the particular shift pattern and work.

Biological clocks

A master clock in the brain coordinates the various body biological clocks so that they are in synch. The biological clocks in turn drive our circadian rhythms. The master clock consists of a group of nerve endings called the suprachiasmatic nucleus (SCN), which is located in the hypothalamus area of the brain close to the optic nerves.



Circadian rhythms are physical, mental and behavioral changes that follow roughly a whole day or twenty four hour cycle. Circadian rhythms are produced by natural factors in the body such as genetic activity and the release of the hormone melatonin, but they are also affected by signals from the environment, especially light.

Melatonin is a hormone produced from the pineal gland in brain. It regulates an internal clock that controls our natural cycle of sleeping and waking hours. In part, our body clock controls how much melatonin our body makes. Normally, melatonin levels begin to rise in the mid- to late evening, remain high for most of the night, and then drop in the early morning hours.

Light affects how much melatonin our body produces. It is the main cue influencing circadian rhythms, turning on and off genes that control the internal clocks. Circadian rhythms can change sleep-wake cycles, hormone release, body temperature and other important bodily functions.

Circadian rhythms are important in determining human sleep patterns. The body's master clock or SCN controls the production of melatonin that makes us sleepy. As it is located just above the optic nerves, which relay information from the eyes (external environment) to the brain, the SCN receives information about incoming light.

When, there is less light, such as at night or in darkness, the SCN directs the brain to produce more melatonin, so you get drowsy or sleepy. Melatonin, which is vital to the suppression of tumors, is released at night. Light shuts down melatonin production, so being exposed to artificial light at night could lead to a melatonin deficiency.

Disruption of the circadian rhythm is linked to various sleep disorders such as insomnia, Disrupted sleep-wake cycles and insufficient hours of sleep. Disrupted circadian rhythms are also associated with depression, bipolar disorder and seasonal affective disorder.

Night and shift work can cause disruption to the circadian rhythms. Basically if you are working at night, you are not sleeping when your body tells you should be.

Conversely when you try to go to sleep during the day it is not easy as the circadian rhythm is telling you that you should be awake and this is supported by cues such as daylight and normal daytime external environmental activities such as traffic and noise, which make it more difficult to sleep.

Our internal body clocks can change gradually but are resistant to abrupt changes brought on by night and shift work. Nor will they ever fully adjust, even for those workers on permanent night shifts. Such workers may sleep during the day when

they are on their rest period between shifts but on days off their body clocks will attempt to reset to normal circadian rhythms.

The end result of disruption of the circadian rhythms is loss of sleep and disturbed sleep, which both lead to fatigue.

Unduly extended shift

Sleeping difficulties

We all need proper sleep in order to wake up refreshed and energized for the day's activities. Sleeping is restorative both physically and mentally. It allows the body to recover from the days exertions, be they physical or cognitive activities.

People who have problems sleeping can become anxious and worried when they lie awake. They may get some broken periods of sleep but when they get up they are still tired and lack energy. Insufficient sleep is associated with tiredness leading to accidents and errors as the body and mind are out of tune with their environment. Because of our circadian rhythms and external cues such as sunlight, temperature, voices, traffic, family and domestic responsibilities, it is much more difficult to get a proper sleep of sufficient duration without interruptions during

daylight hours. This lack of sleep leads to “sleep debt” whereby the body knows it has had insufficient sleep and although we can cope with this temporarily, eventually when working in a night shift, we will feel a deep need of sleep and may fall asleep on the job despite other external cues.

Fatigue

Fatigue is the decline in mental and/or physical performance that results from prolonged exertion, lack of quality sleep or disruption to the circadian rhythms. It is a feeling of tiredness and being unable to work effectively. A fatigued person will be less alert and perceptive, less able to process information and have slower reaction times than someone who is not fatigued. A person who is fatigued may fall asleep momentarily while at work or driving home, which can be extremely dangerous.

Fatigue results from an imbalance between work demands and rest and recovery periods. Poorly designed shift work patterns and long working hours are likely to result in fatigue. Fatigue is the most common adverse effect of shift and night work.

Fatigue can also lead to errors and accidents while chronic fatigue is associated with a number of adverse health effects and illnesses outlined below.

Health effects

There are a number of well documented illnesses associated with night and shift workers, while other emerging risks are presently undergoing evaluation and research. Night and shift work are also known to exacerbate a number of pre-existing illnesses. The majority of illnesses are due to disruption of the circadian rhythms resulting in hormone imbalance (melatonin suppression), sleeping difficulties and fatigue.

Chronic fatigue resulting from night and shift work is strongly associated with gastrointestinal illnesses such as abdominal pain, chronic gastritis, peptic ulcers and cardiovascular illnesses such as hypertension and coronary heart disease.

There is strong evidence for reproductive problems in female shift workers, especially those carrying out night work. This is why under the Pregnancy at Work Regulations 2007, pregnant night workers can be moved to day work if it is the opinion of a doctor that the night work is having a detrimental effect on their health or the developing child.

The International Agency for Research on Cancer (IARC) of the World Health Organization (WHO) classified night work as a probable carcinogen in 2009.

Shift work is also known to exacerbate pre-existing illnesses for night and shift workers. These include asthma, diabetes, epilepsy and psychiatric illness. This is why night workers have been given an entitlement to a health assessment under the Night Work and Shift Work Regulations to assess their suitability for such work before commencing work and then at regular intervals thereafter.

Individual factors

Individuals react differently to the effects of night and shift work. Workers who do the same shifts and same tasks can experience different health effects. Some will remain perfectly healthy while others may develop health problems. This reflects a combination of factors including: age, gender, lifestyle, attitude and behavior.

Individuals' tolerance of shift work varies according to their:

• Ability to sleep (some people are good sleepers regardless while others find it difficult to fall asleep and even when they do, they wake up a number of times)

• Ability to adapt to changes in shift pattern

• Ability to adapt to shift work (which decreases with age anyway)

• Different life style behaviors (e.g. alcohol consumption, diet, levels of fitness)

• Different coping mechanisms

Social and family factors

Social and family factors can have a big impact on a shift worker's mental and physical health. Workers who don't have sufficient time to interact with their families and friends because of shift working and the need to rest in between may feel deprived and isolated, leading to moodiness and negativity. This can affect their relationships both at home and at work.

On the other hand, some workers will try to maintain a normal family and social life, but as a result not sleep sufficiently and end up fatigued. Thus there is a fine balance to be struck between these competing demands. The design of shift patterns can have a major impact in this area (e.g. 8 hour versus 12 hour, 2 daytime shifts not involving a night shift, no shift working at weekends, etc.

Errors and accidents

The risk of errors and accidents has been found to:

• Be higher on night shifts

• Rise with increasing shift length over an 8 hour threshold.

• Increase over successive shifts (especially night shifts).

• Increase when there are insufficient breaks.

The main cause is poorly designed shift schedules resulting in fatigue, which in turn leads to poor performance resulting in errors and accidents. These can be a mixture of minor and major incidents. Fatigue is a major contributory factor in road traffic accidents.

Fatigue, night work and shift work arrangements have been found to be contributory factors to such well known incidents as Three Mile Island (nuclear power station release) in 1979, Bhopal (chemical plant explosion) in 1984, Challenger Space Shuttle (rocket explosion) in 1986, Chernobyl (nuclear power station release) in 1986, Buncefield (oil refinery explosion) in 2005.

Clapham Junction (rail crash) in 1988, Exxon Valdex (ship oil spill) in 1989 and the Buncefield (oil refinery explosion) in 2005.

Advantages working in shifts

For employers

• More intensive use of facilities and equipment via extended capital operating time.

• Increases in production to cope with higher demand or to deal with perishable goods.

• Effective operation of continuous and semi-continuous production processes.

• Optimal use of energy or other resources during the night or other slack periods.

For employees

• Higher total earnings where premium wages are paid for certain types of shifts (e.g. shifts involving night work).

• Longer periods of free time if paid time off is granted in lieu of shift work payments.

• May potentially save existing jobs and/or reduce precarious employment.

Disadvantages of working in shifts

For employers

• Additional administrative costs resulting from having more workers (because more shifts are in operation).

• Complexity and difficulty in ensuring adequate supervision, especially at night.

• Higher labor costs due to shift premiums, provision of welfare facilities and training.

• Potential negative effects on workplace safety and health, especially where night work is involved.

For employees

• Potential negative effects on workers' health and safety, especially where night work is involved. These potential effects include disruption of sleep, increased fatigue, cardiovascular and gastro-intestinal troubles, effects on reproductive health, increased risk of breast cancer (for women on night shifts).

• Disruption of workers' family and social life, especially due to "unsocial" and irregular hours of work.

• Difficulties in transport to and from work, especially for night workers.

• Work intensification, for example, through the suppression of breaks.

• Reduced access to training or other opportunities for workers on non day shifts

SECTION B :REVIEW OF LITERATURE

Folkard in 1996 tabulated the one of the major problems that shift workers are confronted with is that they are required to ignore their diurnal nature, and to work and be active at times that they should actually relax, which is also known as desynchronization of the circadian periodic functions.

Nachreiner et al. 1995, Costa 1996), A˚ kerstedt 1985) on their research study identified that among the physical health variables, sleep problems, gastrointestinal and psych vegetative disorders count as the most frequently studied, whereby employees who work in rotating shifts report more physical health complaints than those with fixed shifts.

Haus and Smolensky (2006) reviewed several possible effects of a disruption in circadian rhythms on shift workers. It can result in insomnia or non-restorative sleep during the period of adjustment to a new schedule. It can also lead to changes in hormone levels, which can influence cell growth and division. Moreover, workers rarely become completely habituated to unusual shifts. Even after a long time on night shifts, only a minority of workers show adaptation of their circadian system to the nocturnal activity pattern, in part because night workers usually revert to the usual sleep/wake cycle on days off.

Shift work can also have adverse health effects through its potential impact on behavior, such as poorer quality diet, or increased smoking or alcohol consumption. Bøggild and Knutsson (1999) reported that shift workers are more likely than regular day workers to be smokers. Finally, shift work may disrupt social and family relationships, by putting the worker's daily pattern of work and rest out of phase with that of family, friends and the social life of the community. This social disruption can also contribute to stress and thereby to adverse health outcomes.

Shift work is defined as "nonstandard schedules requiring that at least 50% of the work be done at a time other than between 8 am and 4 pm" (Jaffe & Smolensky, 1996). It is increasingly becoming more popular to work at night. Many occupations require shift work such as: the medical profession (e.g., doctors, nurses, and rescue workers), public safety (e.g., law enforcement and fire), industrial workers, telecommunication workers, transportation and night service workers (e.g., restaurants, shopping, and entertainment). Today, many people view shift work as driving society's response to the challenges of the need for constant growth and prosperity (Hossain & Shapiro, 1999). An estimated 25% of people now work night shifts in most Western societies, despite the growing concern over the detrimental effects that may result for individual shift workers.

Shift work can have many physiological, psychological, and social effects on a person. The primary reason that these problems occur is due to the disruption of the normal sleep-wake cycle. Humans develop a diurnal rhythm (i.e., they sleep at night and stay awake during the day). This daily cycle is consistent from day to day; therefore, humans are most productive and alert during daytime hours. If this diurnal rhythm is disrupted, the body undergoes dramatic changes and sleep becomes difficult (Schultz & Schultz, 1994). The extent to which the circadian rhythms (i.e., biological rhythms) of the shift worker adjusts to this new routine of nighttime work and daytime sleep may have a great influence on the severity of the problems experienced (Barton, 1994).

Shift work has been found to predict health problems including coronary heart disease and gastrointestinal complaints. Kiviamki et al., (2001) stated that along with rhythm arguments, other explanations of ill health are that shift work may lead to poorer health habits (e.g. increased consumption of alcohol and cigarettes, reduced physical activity, and being overweight). When this is combined with sleep deprivation and stress the immune system is weakened, causing one to be more susceptible to many illnesses and diseases.

In a study conducted using nurses, it was found that recovery from working nightshifts can take up to two days (Totterdell, Spelten, Smith, Barton & Folkard, 1995). This study also found that ratings of alertness increased and reaction time decreased over four night shifts. This may suggest increasing adjustment to night shifts and hence, brings up one of the biggest problems with working at night. It takes at least two days to adjust to night work after a diurnal schedule and then takes at least two days to recover back to a diurnal schedule. The body is constantly being forced to change and adapt to new schedules, which brings about physiological and psychological stress. This would also affect shift workers who are not on a rotating schedule because most adapt back to a diurnal cycle on the weekends.

Ottmann et al., (1989) conducted a study on shift working police officers and health status. The researchers gave 2659 police officers questionnaires that addressed health issues such as abdominal pain, lack of appetite, disturbance of sleep and backache. It was found by the researchers that disturbance of appetite was not a common occurrence. However, nervous symptoms and gastro-intestinal symptoms were more often reported than the other symptoms. The prevalence rates of all symptoms consistently showed a main effect of shift work. Ottmann et al., concluded that actual shift work decreased the well-being of police officers.

Depression is another factor that affects many shift workers. While there has not been a lot of research on depression and shift work, there is research conducted by Ford and Kamerow (1989) that suggests a link between poor sleep and the development of depression. They reported that people suffering from insomnia had a much greater risk for developing major depression than individuals with normal sleep.

SECTION C : OBJECTIVES

- To assess if there is an impact of the shift timings on the physical health of employees currently working for the 'X Project' at ABC Consulting, Bengaluru, India.

- To assess an impact of shift timings on the psychological health of the employees working in the 'X Project' using a standard DAS21 scale.

*,** The name of the project and company is being withheld as per the client agreement.

SECTION D: METHODOLOGY

Study Type

This study is an Analytical type of study design.

Study Area

The study was conducted for the 'X Project' in the ABC Consulting Private Limited, Bengaluru ,India.

Study Population

The study population included all the one fifty employees working in the morning and evening shifts for the US based client in the 'X Project'.

Sample Size

The study was conducted by selecting **fifty (50)** employees from the study population through simple random sampling.

Data Collection Tool

Primary Data

A Semi structured questionnaire was prepared for the purpose of evaluating the impact of shift timings on the physical health of the employees. For the evaluation of the psychological health the DASS 21 scale was utilized.

Data Analysis

The data was analyzed using Microsoft Excel 2010.

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SECTION E: RESULTS

For the organization the number of individuals who were working in the various shifts at the ABC Consulting Private limited under the "X" Project is depicted as follows in the table 1**.** It may be noted that more than 50 percent of the workforce recruited were females which is in line with the motto of the company to promote sex equality and gender diversity in the working environment**.**

Table 1: Sex- wise distribution of employees working the various shift timings.

Employees Working in	**Male**	**Females**	**Total Employees**
Morning Shift	24	27	51
Evening Shift	36	63	99
Total Employees	60	90	150

The total percentage of the employees working in the evening shift was about 67 percent of the total workforce in the project. Based on the feedback received during the course of the study the shift timings were usually fixed, although there was a system of bimonthly rotation for the employees.

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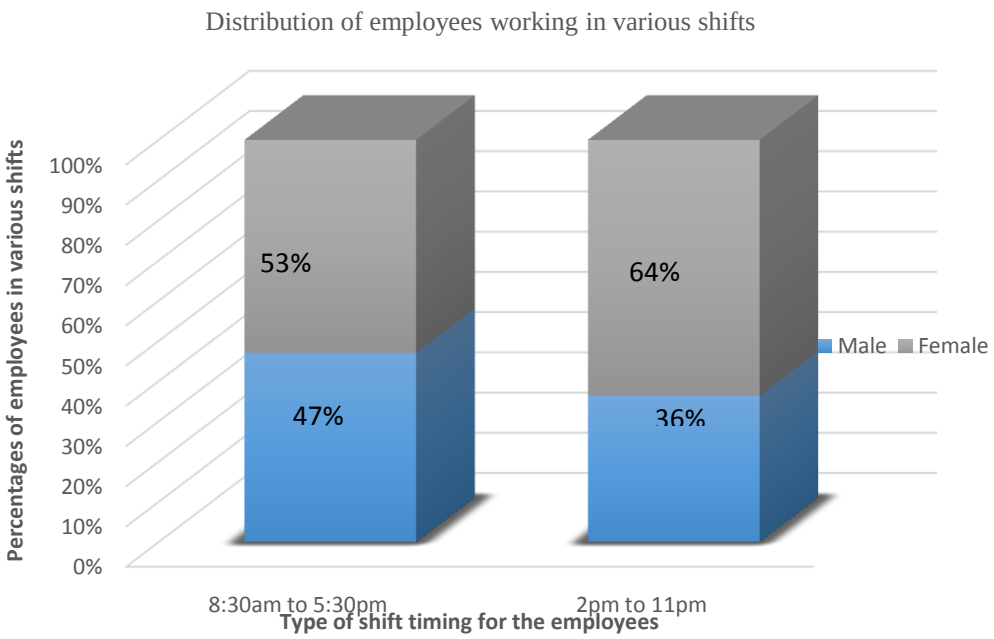

Figure 1: The percentage distribution of the sex- wise workforce for different shift timings.

For the purpose of assessing the physical health of the employees working in both the shifts a questionnaire was prepared. This questionnaire included detailed information about the common physical illnesses suffered by the employees due to continuous abnormal working hours.

A standard T- Test: Two sample with equal variances was applied in Microsoft Excel to understand the impact of both the shift timings on the physical health illnesses suffered by the employees working in these shifts.

The null hypothesis made was 'There is no effect of physical illness to the work timings of the employees'

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The results obtained are depicted as follows:-

Table 2: Depicts the results of the T-Test applied to the group of employees in various shifts for studying the impact of physical illness on the shift timings.

T-Test	***Evening shift***	***Morning Shift***
Mean	1.825	0.2
Df	48	
t Stat	2.74	
P(T<=t) two-tail	0.0086	

The two tailed p value obtained was less than the alpha value (.05) and t calculated is more than t tabulated (2.01) hence we reject the null hypothesis and the data is statistically significant.

The following figure further depicts the most common illnesses seen in the employees. It may be noted that fatigue and strain in eyes are the most common illnesses observed in the individuals. Further the frequency of illnesses were calculated and divided into three categories – sometimes(less than 2 days) , often(3-4 days), Almost always(4-7 days).

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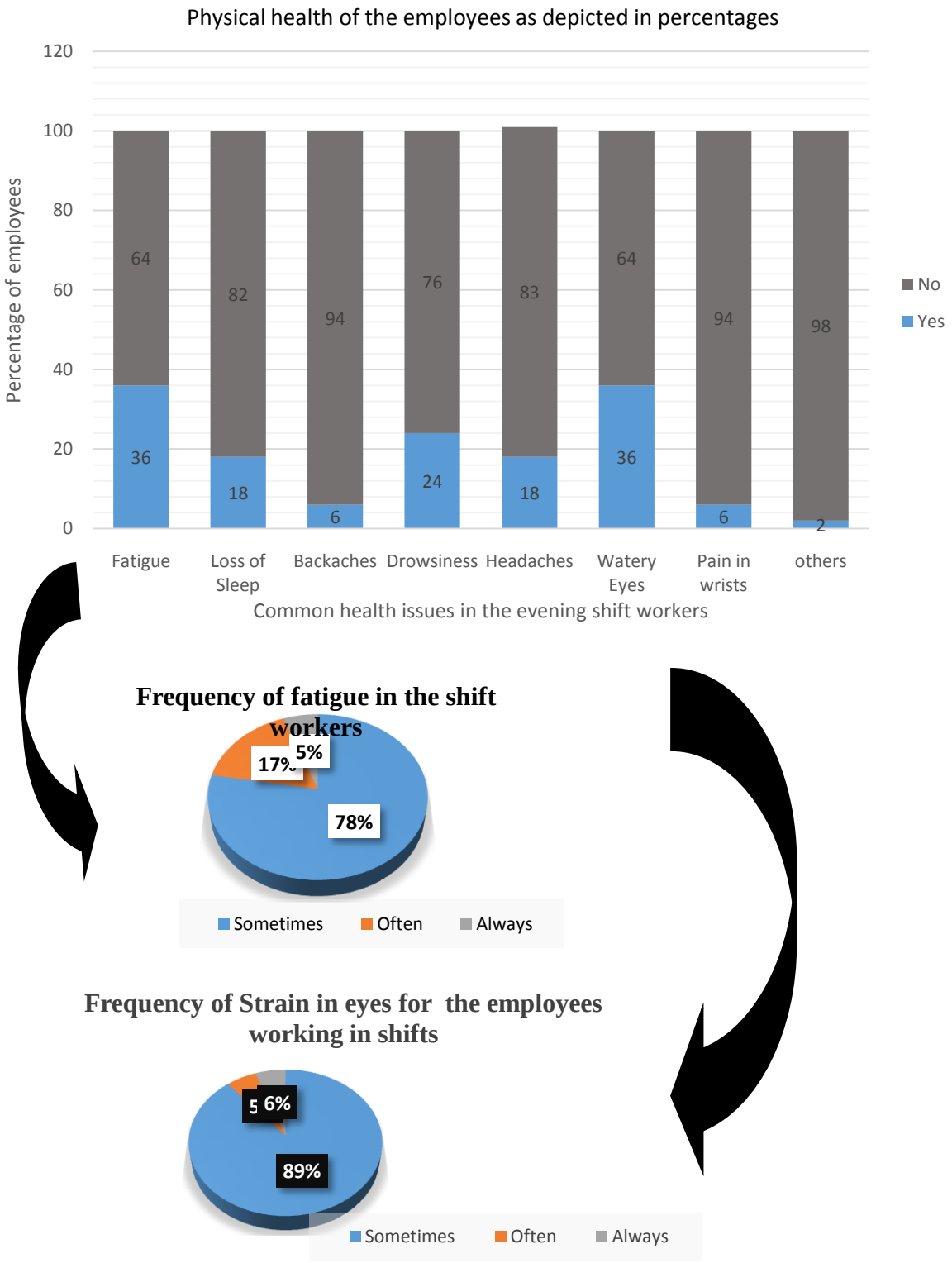
Figure2: The physical health status of the employees working in the evenings.



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Based on the results obtained it was observed that there were two major health issues which were seen commonly in the employees particularly in the evening shifts namely, fatigue and strain in the eyes. The frequency was attributed to sometimes for fatigue (78 percent) and strain in the eyes (89 percent).

Further the second variable used to evaluate the physical health was the nutritional status of the individuals.

The null hypothesis made was 'There is no impact of the shift timings on the nutritional health of employees' .The t test we observed the p value (.05< 6.2) ; indicating that we fail to reject the null hypothesis hence tabulating that there is no significant impact of shift timings on the type of nutrition employees prefer during work hours.

Table 3:. The results of the T-Test applied to the group of employees in various shifts for studying the impact of nutritional change of habits on the shift timings

T test	***Evening Shift***	***Morning Shift***
Mean	0.8	0.1
Df	48	
t Stat	5.08	
P(T<=t) two-tail	6.20	

The questionnaire helped in assessing the exact impact of the timings on the nutritional status as about 72 percent of the employees working in the evening shifts in particular accepted that they have variable timings for the meals. Further on evaluating the type of food preferences in the employees it was observed that

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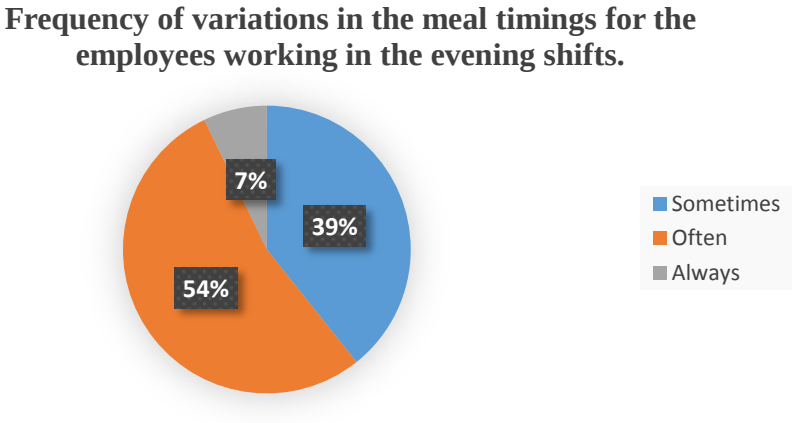
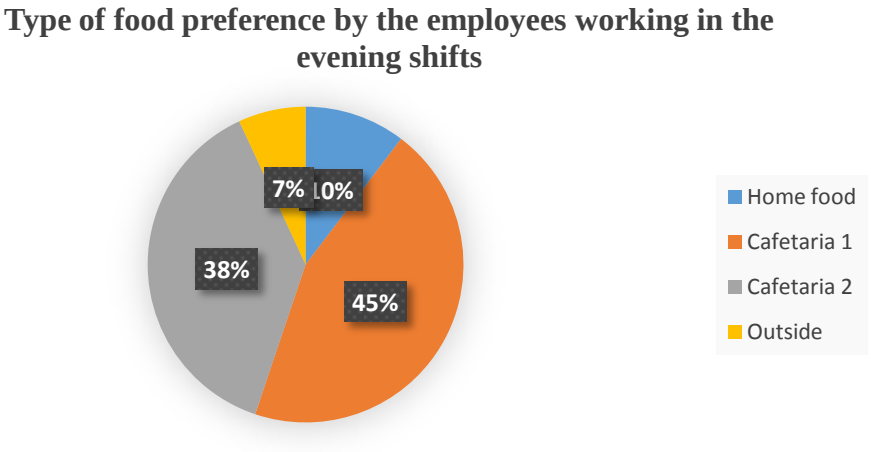
the 90 percent of the employees where dependent on the various cafeteria operating in the campus which primarily provides junk food. About 80 percent of the employees gave an affirmative response on the questions assessing the fluctuations in the weight in ascending order (87 percent) over past six months remaining 13 percent reported reduction in their weight. But as suggested by the results of the t-test we cannot form a statistical relationship between the nutritional health and working timings of the employees.

Figure 3: Figure depicting the impact of evening timings on the nutritional status of the employees.





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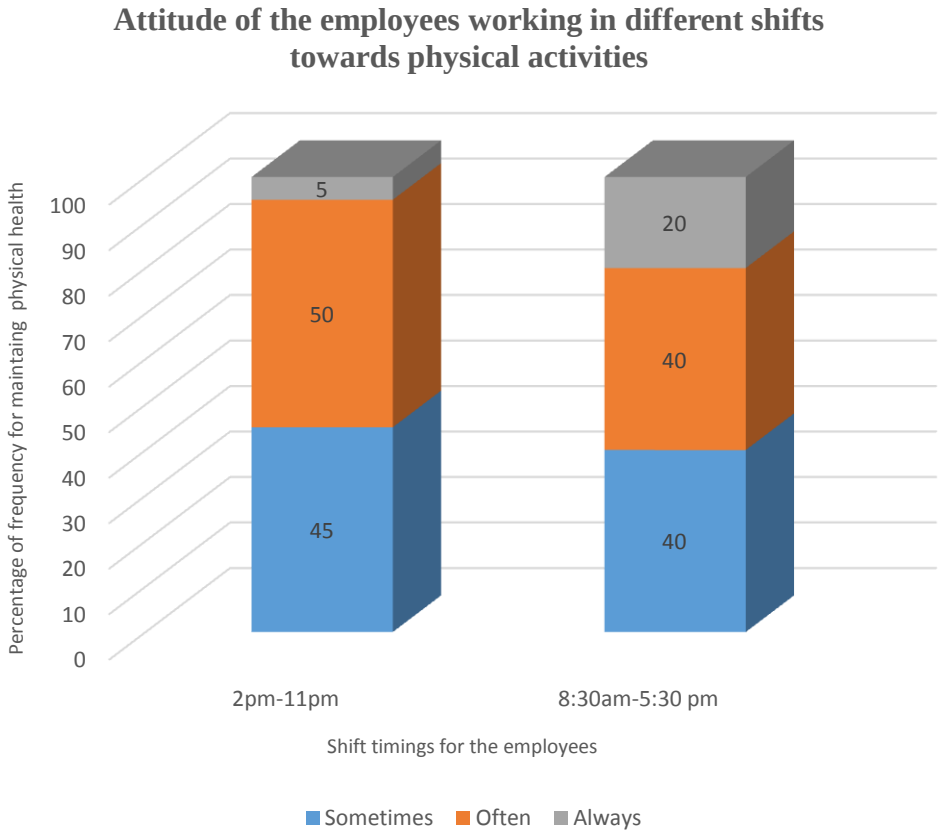
The third variable which was taken into account was in general the attitude of the employees towards maintaining in their physical fitness. It was observed that the at an average there is no significant variations observed in the attitude of the individuals towards the inclinations for involving themselves more in the physical activities for both the shifts.

Figure 4 : The attitude of the employees for maintain their physical health



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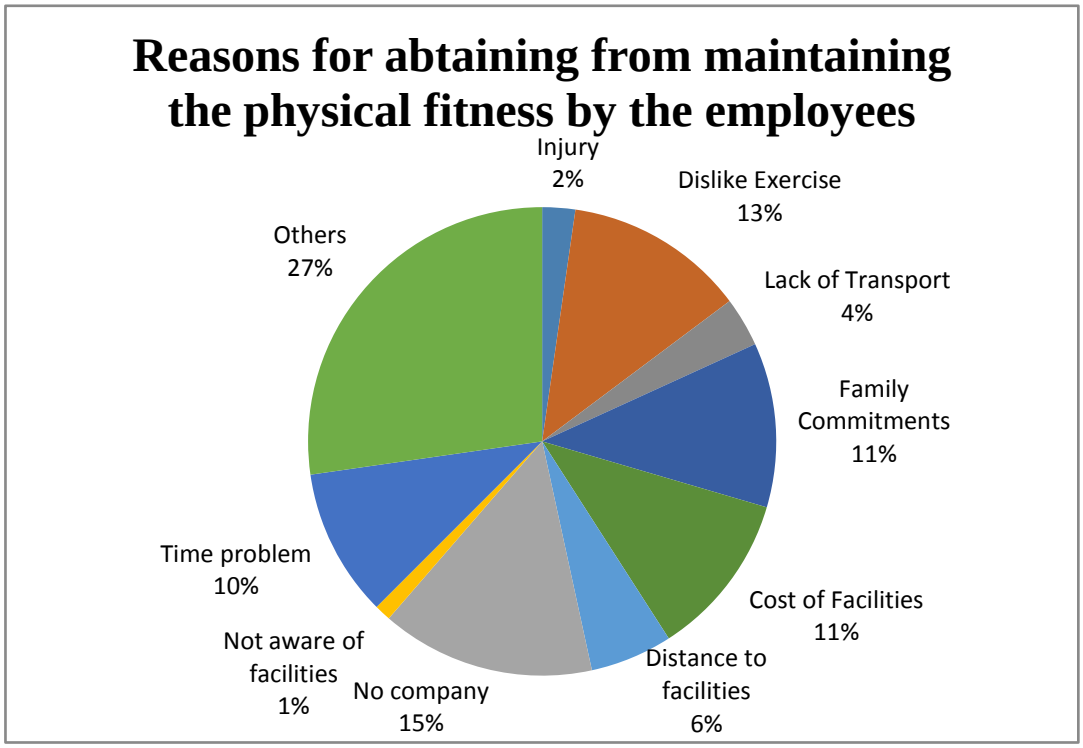

Figure 5: Figure depicting the parameters on which the attitude of the employees depends on maintaining their physical health.

The third objective involved to assess the relationship of the shifts timings on the psychological health of the employees. For evaluating this aspect the scoring criteria was explained to the samples and the relevant responses were marked which were tabulated using the score guide available**.**

The DASS scale given an ordinal rating to the questions based on the degree to which it is applicable to the person. To assess the impact of the three parameters Depression, Anxiety and Stress on the two study groups the T test was applied as the scoring criteria involved in the evaluation.

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The null hypothesis made was 'Working in shifts do not lead to depression in the employees'. The p value (two tailed) obtained was more than .05 value of alpha. Hence we accept the null hypothesis.

The test was applied on the two study groups and the results were tabulated as follows ;-

Table 4:-Depicts the observations for the t test applied between two groups of shifts to evaluate the level of Depression in the psychological health of employees.

Shift timings	***2pm-11pm***	***8:30am-5:30 pm***
Mean	1.275	1.9
df	48	
t Stat	-0.94	
P(T<=t) two-tail	0.35	

For the assessing the impact of Anxiety the null hypothesis made was ' Anxiety is not seen in the employees working in the shifts'. The two tailed p-value (.85) obtained was more than the alpha value of .05 hence we accept the null hypothesis. The following table gives the results of t-test applied:-

Table 5: Depicts the observations for the t test applied between two groups of shifts to evaluate the level of Anxiety in the psychological health of employees

Shift timings	***2pm-11pm***	***8:30am-5:30pm***
Mean	1.1	1.2

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df	48	
t Stat	-0.18	
P(T<=t)two-tail	0.852041131	

To assess the third variable ‘ Stress’ of the DASS21 scale the null hypothesis was

‘ Working in the shifts do not lead to Stress in the employees’ The resultant t-test was accepted as the p value (two tailed) was more than the value of alpha .The following table depicts the results obtained :-

Table 6: T-test applied between two groups of shifts to evaluate the level of Stress in the psychological health of employees.

Shift Timings	***2pm-11pm***	***8:30 am -5:30pm***
Mean	2.575	2.6
df	48	
t Stat	-0.026	
P(T<=t) two-tail	0.98	

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SECTION F : DISCUSSION

The project under the study was exclusively for a US based client hence the working hours were managed for the study population of one fifty individuals, principally under two shifts schedules, morning shift (8:30 am -5:30 pm) and evening shifts (2 pm-11pm). This system of shift schedule ensured a twenty four hour seven day long continuous support to the US counterparts**.**

It was noted during the study that the workforce included in general female predilection who preferred an evening shift over the morning shifts for the following reasons :-

- Continuous interaction with the client user end.
- Timings allow them more committed towards the profession and personal engagements.
- Increased satisfaction from profession delivery.

To facilitate the study a questionnaire was prepared to evaluate the physical health of the employees and the standard DASS 21 scale was utilized to study the psychological health of the employees**.** (*The scoring for the references are provided in the appendix for the DASS 21 Scale.)

The samples were divided into two study groups- Group 1 for employees in 2pm-11pm (evening shift) and Group 2 for employees working in 8:30 am-5:30 pm (morning shift). A total sample size of fifty was taken as the representative of the one fifty study population. The employees were selected through simple random sampling. It was observed that the average age of the employees working under the current project is approximately 27 years of age. In the study population timings of the shifts were fixed as they preferred the evening shifts due to the above mentioned reasons.

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To evaluate the impact shift timings on the physical health the questionnaire was divided into three subparts. The first part gathered the information about the current physical illnesses if suffered by the employees working in both the shifts. The illnesses that were accounted are most commonly seen in the employees like fatigue, drowsiness etc. The frequency of the illnesses was also tabulated. The p value obtained from t test for the study group showed a conclusive result to link the relationship of the timings on the physical health of the employees.

Most commonly it was observed that 36 percent of the employees working in the evening shifts suffered from fatigue and strain in their eyes. The reasons attributed can be variable sleep timings, dietary habits, medical conditions like flu, dehydration, anemia etc.

There was no significant relation found between the shift timings and the changes in the meal pattern of the employees.

Various reasons which may be responsible for this variability are as follows:-

- Availability of a company for having meals
- Variable number of the tickets allocated to the individuals.
- Prior Commitments for example Meetings, discussions.

The employees preferred their meals from Cafeterias, which are providing meals in south Indian and junk food menu in particular. It was noted that the employees complained of a significant fluctuations in their body weights (Increased) in past six months blaming the timings of work but on evaluation of the third variable the attitude of people towards maintaining their physical health there was no significant relationship which could be attributed towards the work hours and the physical heath of the employees. In fact they were 27 percent of the individuals who accepted laziness as a major reason for lack of involvement in any physical activity like exercising, swimming etc.

For the purpose of understanding the impact on the psychological health of the employees due to the timings of the work hours, the t test was applied such that the observations from the samples were summed and p value was obtained using Microsoft excel. The p value obtained made us accept the null hypothesis that there is no impact of the timings on the observations obtained for depression, anxiety and stress.

The study has the following constraints for evaluating the relationship of the psychological health with the two study groups:-

- The psychological scale includes interpretations from regular follow up over the period of months. Since the duration of the study was comparatively less we can suggest a some of timings and health of the employees but cannot ascertain the same.
- There is an increased probability of the responses being marked under the influence of the current situations being encountered by the employees; hence the biases in responses are not neglected.
- An in-depth survey to ascertain the causes of reduced health of the samples under study could not be conducted as per the rules and regulations of the Organization keeping in view of the confidentiality clauses.
- The DASS21 is applied to a particular variable only it can suggest a relationship but not ascertain the same for deciding the impact .

SECTION G : CONCLUSION

The following elements incorporated as a part of work culture has helped the organization to be committed towards its people and hence is rated amongst the top companies of the world to work for:-

- Individual based work system management.
- Complimentary offs for the employees devoting extra hours towards work commitments.
- Regular psychological counseling sessions.
- Introduction of 'My team' groups where the employees can share their own experiences and difficulties encountered during working.
- Introduction of an internal networking system which can allow the employees to directly approach the leadership.
- Continuous involvement of the leadership with the individuals working with the project to motivate and praise their accomplishments.

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ANNEXURE 1: QUESTIONNAIRE

If wealth is lost, nothing is lost – if health is lost, something is lost!!

Hi,

It is believed that complete overall health is the most valuable asset we can achieve in our life. To achieve this wellbeing we all work in a continuous repetitive cycle of events every day. For overviewing our efforts in this direction the following questionnaire has been prepared to facilitate a research study being conducted by Dr. Raghavi Mittal from IHMR, Jaipur for the purpose of studying the impact of shift timings on the physical and psychological health of the employees working in the ODC of Deloitte.

You are requested to kindly mark appropriate responses in the questionnaire with truthfulness and sincerity to make the study a success.

Thank you!!

** The information provided is anonymous and confidential.

PART 1

***This part of the questionnaire focuses on gathering information about various aspects of your physical health. Please tick the response/responses which are as applicable to you.**

(a) Question numbers 1-5 gathers information about some of your personal demographics.

(1) My age in years is ……..

(2) I am a

- Male
- Female

(3) My current weight (in kgs) is …….

(4) My current work timing are in the following shift:

- 8:30 am – 5:30 pm
- 2pm – 11 pm
- Any other (Please specify) ……

(5) My shift timings are usually ……..

- Fixed
- Rotational Quarterly
- Rotational Bimonthly
- Rotational Monthly
- Flexible, I don't follow the timings!!

(b) Question number 6 with its subparts gathers information about your physical health in the present settings.

6) Do you suffer from any of the following health issues/problems?

(A)Fatigue-

- Yes
- No

If your answer is 'yes' the how often do you suffer from fatigue?

- Applied to me at some degree, or some of the time -Sometimes
- Applied to me at a considerable degree, or a good part of time -Often
- Applied to me very much, or most of the time- Almost always.

(B)Loss of sleep

- Yes
- No

If your answer is 'yes' the how often do you suffer from loss of sleep

- Applied to me at some degree, or some of the time –Sometimes (less than 2 days)
- Applied to me at a considerable degree, or a good part of time –Often(3-5 days)
- Applied to me very much, or most of the time- Almost always.

(C) Backaches

- Yes
- No

If your answer is 'yes' the how often do you suffer from backaches?

- Applied to me at some degree, or some of the time -Sometimes
- Applied to me at a considerable degree, or a good part of time -Often
- Applied to me very much, or most of the time- Almost always.

(D) Drowsiness

- Yes
- No

If your answer is 'yes' the how often do you suffer from drowsiness?

- Applied to me at some degree, or some of the time -Sometimes

- Applied to me at a considerable degree, or a good part of time -Often
- Applied to me very much, or most of the time- Almost always.

(E) Headaches

- Yes
- No

If your answer is 'yes' the how often do you suffer from headaches?

- Applied to me at some degree, or some of the time -Sometimes
- Applied to me at a considerable degree, or a good part of time -Often
- Applied to me very much, or most of the time- Almost always.

(F) Strain in the Eyes

- Yes
- No

If your answer is 'yes' the how often do you suffer from watery eyes?

- Applied to me at some degree, or some of the time -Sometimes
- Applied to me at a considerable degree, or a good part of time -Often
- Applied to me very much, or most of the time- Almost always.

(G) Swelling in wrists

- Yes
- No

If your answer is 'yes' the how often do you suffer from swelling in wrists?

- Applied to me at some degree, or some of the time -Sometimes
- Applied to me at a considerable degree, or a good part of time -Often
- Applied to me very much, or most of the time- Almost always.

(H) If any other health problem please specify …….

If your answer is affirmative the how often do you suffer from this health problem?

- Did not apply to me at all-Never
- Applied to me at some degree, or some of the time -Sometimes
- Applied to me at a considerable degree, or a good part of time -Often
- Applied to me very much, or most of the time- Almost always.

(c) Question numbers 7-11 aims to assess the impact of shifts on your food habits.

(7) Is there any change in your food habits since you have started working?

- Yes
- No

(8) What type of food you prefer in your work hours?

- Home Cooked
- South Indian meals we have in the Cafeteria or similar places.
- North Indian meals we have in the Cafeteria or similar places.
- Anything at the Mahalaxmi Cool Corner.
- Any other (Please Mention)……

(9) Is your meal timings variable due to your working schedule?

- Did not apply to me at all-Never
- Applied to me at some degree, or some of the time -Sometimes
- Applied to me at a considerable degree, or a good part of time -Often
- Applied to me very much, or most of the time- Almost always

(10) Has there been any significant fluctuations in your weight during past six months?

- Yes
- No

11) If the answer to the above question is yes, Please answer the following.

- My weight has increased.
- My weight has decreased.

(d) This part of the questionnaire in question numbers 12-13, gathers information about your physical activities.

12) How much time do you prefer spending on physical activities for example like walking, jogging, cycling, gyming or swimming?

- Did not apply to me at all-Never
- Applied to me at some degree, or some of the time -Sometimes
- Applied to me at a considerable degree, or a good part of time -Often
- Applied to me very much, or most of the time- Almost always

13) Due to the following reasons I cannot involve myself in maintaining my physical fitness as often I would like to?

*Tick an **option** that applies to you.*

- Injury
- Dislike sport/ exercise
- Lack of transport
- Poor health

- Family commitments
- Cost of facilities
- Distance to facilities
- Work commitments
- No-one to do it with
- Not aware of facilities/classes available
- Facilities not available when I can attend

Other (*If any, please state*)……

*** In this part of questionnaire the DASS21 scale is being used to evaluate the psychological health of the employees. The Dass Scale can be used for evaluation on a weekly basis.**

In the following questions you are requested to mark the responses based on the following parameters:-

0 – Did not apply to me at all-Never

1- Applied to me at some degree, or some of the time -Sometimes

2- Applied to me at a considerable degree, or a good part of time -Often

3-Applied to me very much, or most of the time- Almost always

---

(1)**I found it hard to wind down**.

1	2	3	4

(2) **I was aware of dryness of my mouth**.

1	2	3	4

(3) **I couldn't seem to experience any positive feeling at all.**

1	2	3	4

(4) **I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion).**

1	2	3	4

(5) **I found it difficult to work up the initiative to do things**.

1	2	3	4

(6) **I tended to over-react to situations.**

1	2	3	4

(7) **I experienced trembling (eg, in the hands).**

1	2	3	4

(8) **I felt that I was using a lot of nervous energy.**

1	2	3	4

(9)**I was worried about situations in which I might panic and make a fool of myself**.

1	2	3	4

(10) **I felt that I had nothing to look forward to.**

1	2	3	4

(11) **I found myself getting agitated**.

(

1	2	3	4

12) **I found it difficult to relax.**

1	2	3	4

(13) **I felt down-hearted and blue.**

1	2	3	4

(14) **I was intolerant of anything that kept me from getting on with what I was doing.**

1	2	3	4

(15) **I felt I was close to panic.**

1	2	3	4

(16) **I was unable to become enthusiastic about anything.**

1	2	3	4

(17) **I felt I wasn't worth much as a person.**

1	2	3	4

(18) **I felt that I was rather touchy.**

1	2	3	4

(19) **I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat).**

1	2	3	4

(20) **I felt scared without any good reason.**

1	2	3	4

(21) **I felt that life was meaningless.**

1	2	3	4

Thank you for your valuable responses and helping me carry out my study in an effective efficient manner.

Regards

Dr. Raghavi Mittal

BTA-Intern

ANNEXURE II: DASS 21 SCALE

***DASS 21 Scoring guide results :-**

The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress.

Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia and inertia.

The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable / over-reactive and impatient. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items.

The DASS-21 is based on a dimensional rather than a categorical conception of psychological disorder. The DASS-21 therefore has no direct implications for the allocation of patients to discrete diagnostic categories postulated in classificatory systems such as the DSM and ICD.

Recommended cut-off scores for conventional severity labels (normal, moderate, severe) are as follows:

NB Scores on the DASS-21 will need to be multiplied by 2 to calculate the final score.

	Depression	**Anxiety**	**Stress**
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

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