

**WORKRELATED MUSCULOSKELETAL DISORDER AND IT'S
ASSOCIATED FACTOR'S AMONG THE SCHOOL TEACHER'S AT
SAVAR**

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We the under signed certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled.

Work related Musculoskeletal Disorders and Its Associated Factors among the School teachers at Savar

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Declaration

I declare that the work presented here is my own. All sources used here have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation or dissemination of information of the study, I would be bound to take written consent from the Physiotherapy department of Bangladesh Health Professions Institute (BHPI).

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CONTENTS

| | Page No. |
|--------------------------------------|-----------------|
| Acknowledgement | i |
| Abbreviation | ii |
| List of figures | iii |
| Abstract | iv |
| CHAPTER-I: INTRODUCTION 1-9 | |
| 1.1 Background | 2-5 |
| 1.2 Justification of the study | 6-7 |
| 1.3 Research question | 7 |
| 1.4.1 General objective | 7 |
| 1.4.2 Specific objective | 7 |
| 1.5 Conceptual framework | 8 |
| 1.6 Operational definition | 9 |
| CHAPTER-II: LITERATURE REVIEW | 10-18 |
| CHAPTER – III: METHODOLOGY | 19-23 |
| 3.1 Study design | 19 |
| 3.2 Study sites | 19 |
| 3.3 Study area | 19 |
| 3.4 Study population and Sampling | 19-20 |
| 3.4.1 Sampling procedure | 20 |
| 3.4.2 Inclusion criteria | 20 |
| 3.4.3 Exclusion criteria | 20 |

| | Page No. |
|--|-----------------|
| 3.5 Sample size | 21 |
| 3.6 Data collection method and tools | 21-22 |
| 3.7 Data analysis | 22 |
| 3.8 Informed consent | 22-23 |
| 3.9 Ethical consideration | 23 |
| CHAPTER - IV: RESULT | 24-43 |
| CHAPTER- V: DISCUSSION | 44-46 |
| CHAPTER - VI: CONCLUSION & RECOMMENDATION | 47-48 |
| REFERENCES | 49-52 |
| APPENDIX | 53-72 |

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Acronyms

| | |
|-------------|---|
| BHPI | :Bangladesh Health Professions Institute. |
| CRP | : Centre for the Rehabilitation of the Paralysed. |
| MSD | : Musculoskeletal Disorder. |
| SPSS | : Statistical Package of Social Science. |
| WRMD | : Work Related Musculoskeletal Disorder. |
| WHO | : World Health Organization |
| BMRC | : Bangladesh Medical Research Council |

List of figures

| | Page No. |
|---|-----------------|
| Figure -1 Age of the participant | 24 |
| Figure-2 Male and female ratio | 25 |
| Figure-3 Educational level of the participant | 26 |
| Figure-4 Marital status of the participant | 27 |
| Figure-5 Job duration of the participant | 28 |
| Figure-6 BMI of the participant | 29 |
| Figure-7 Existing Disease of the participant | 30 |
| Figure-8 Tiredness after end of working day | 31 |
| Figure-9 Affected body parts | 32 |
| Figure-10 Types of Musculoskeletal discomfort | 33 |
| Figure-11 Carrying out the same work almost the whole day same time | 34 |
| Figure-12 Types of posture during teaching | 35 |
| Figure-13 Depression with Current job of the participant | |

List of tables

Page No.

| | | |
|---------|---|----|
| Table-1 | Association between Age and Musculoskeletal disorders | 37 |
| Table-2 | Association between Job duration and musculoskeletal disorders | 38 |
| Table-3 | Association between BMI and Musculoskeletal disorders | 39 |
| Table-4 | Association between Tiredness after end of working day and Musculoskeletal disorders | 40 |
| Table-5 | Association between Carrying out the same works the whole day and Musculoskeletal disorders | 41 |
| Table-6 | Association between Types of work during teaching and Musculoskeletal disorders | 43 |
| Table-7 | Association between Depression with Current job and Musculoskeletal disorders | 44 |

Abstract

Background: Teachers represent an occupational group who appear a high prevalence of musculoskeletal symptoms in different study of different country. Teacher often involve in different duties and responsibility that may be carried out uncomfortable working condition and causes of developing musculoskeletal symptoms in different body region. In Bangladesh, there is limited information on musculoskeletal symptoms among teachers. Therefore, this study conducted to estimate the current situation of musculoskeletal symptom among School teachers. **Aim:** To estimate the prevalence of work related musculoskeletal disorders and associated factors among the School Teachers at Savar. **Method:** The prospective quantitative research was carried out to accomplish the objective of the study. 90 participants among the Teachers were selected as simple random sampling technique. The investigator used a mix of both structured and semi-structured questionnaire and participants were requested to give opinion based on the structure of the question. Data were numerically coded and put in both Excel and SPSS 20.0 version software program. Descriptive statistics were performed to obtain the result of the study. **Result:** In this study, developing musculoskeletal symptoms in different body area- In Neck is 33.3% , in Lower back is 21.1% participants ,in upper back 17.8% ,in shoulder 17.8% , In wrist 11,1%, in elbows 2.2%, In Thighs 34.4%, Knees in 27.8% and in ankles 47.8%. **Conclusion:** Bangladesh is a developing country. The prevalence of musculoskeletal symptoms are very high among bank workers here in comparison with a developed country. Lack of awareness, lack of ergonomic practices, lack of research and government funding are the factors which mostly contribute to the increase in the prevalence of musculoskeletal symptoms. This study can be helpful to solve these problems.

Key words: Musculoskeletal symptoms, Risk factors, Ergonomics, School teachers.

1.1 Background

Musculoskeletal disorders are one of the most common health problems in our society (Chaiklieng & Suggaravetsiri, 2012). Work related musculoskeletal disorder were the most deleterious inflammatory and degenerative conditions that affect the joints, soft tissues, peripheral nerves and supporting blood vessels. Musculoskeletal injuries resulting from a work-related incident was called work-related musculoskeletal disorder (Akrouf et al., 2010). It could cause subsequent pain and disability of neck, shoulders, elbow, arms, wrists, hands, hip, knee and ankle functions. It affects all persons irrespective of age and sex (Abledu & Abledu, 2012) especially those who did long period of repetitive movement or forceful activity in poor or awkward working posture (Maduagwu et al., 2014). Tenderness, aches and pains, tingling, swelling, stiffness, muscle spasms etc were some sign of musculoskeletal disorders (Janwantanakul et al., 2008).

Musculoskeletal disorders (MSD) represented one of the most common and important occupational health problems in working populations like school teachers, doctors, nurses, drivers, shop keepers etc. These disorders reduced efficacy at job which was the causes of sick leave, nonattendance and giving up work and were also costly in terms of treatment and separate pain. School teachers were at a high risk of musculoskeletal disorders (Erick & Smith, 2011).

School teacher played an important role in converting young children into a productive adult. Teachers are definitely a part models for their students. They had proper duty in the whole physical and mental improvement of their students (Mesaria & Jaiswal, 2015). Teaching in a school was one of the significant profession in the world as it was the primary school teacher under whose supervision the young child is settled into a complete human resource that played an important role in the development of the nation. Teachers were carrying out various responsibilities that caused physical health complications, during a day. The actions of a teacher was not just include in teaching the students, but also building of lessons, assessing the students work and being involved in the other works such as inventive art and games done by the students. Teachers had to

join in many schools working group. It might be the reason to suffer from psychological and bodily health issues of teachers (Chan & Chong, 2010).

Teacher had to complete tasks like teach definite subject to children, check the notebooks of students, keep up the classes discipline, write on the black board, command notes to students and take presence. The nature of the school teachers job included a head down posture, frequent reading, assignment correction, repeated writing on a high board, sustained sitting in front of a computer and standing up teaching in class, all of which were unsafe activities and they were responsible for developing the risk of musculoskeletal disorders (Chaiklieng & Suggaravetsiri, 2012).

Musculoskeletal condition such as low back pain, pain in the neck/ shoulder, arm, pain in joints, bones and muscles were one of the common and commonly happening illness resulting from unusual posture over a period of time. It was often seen in many working conditions (in schools) that teachers are forced to take up bad working postures due to poor strategy of work, workplace and tools. The work environment of the school teachers was their classroom. The teachers was required to adjust in their present work situation while teaching. The unwell planned work environment of the classroom might had a straight effect on the efficiency of the teacher resulting in their poor health and quality of teaching. At the same time the teacher might also experience distress in the posture assumed by them while teaching, leading to several musculoskeletal disorders. If this condition was continued for longer distance of time, it might had its thoughtful consequences for the teacher as an worker and as well as for the students too (Mesaria & Jaiswal, 2015).

During the course of their work, teachers might be subjected to conditions that caused physical health problems (Chong & Chan, 2010). The impact of MSD specifically within the teaching profession had not been given sufficient attention in the literature. Furthermore, comparatively little research had investigated the prevalence of MSD in the teaching profession (Erick & Smith, 2011).

School teachers, in general, had been demonstrated relative to other occupational groups, to report a high prevalence of MSD (Cardoso et al., 2009), with prevalence rates of between 40% and 95% (Allsop & Ackland, 2010).

According to National Occupational Research Agenda (NORA) in USA said, “that work-related MSD was a major purpose for work-related complaints in the Current assessments of the cost related with MSD range from \$13 to \$54 billion annually in United States 10.e were also expensive in terms of treatment and distinct pain (Marras et al., 2009).

In the united kingdom almost 1.1 million people suffered from musculoskeletal disorders, and 11.6 million employed days were lost (Akrouf et al., 2010).About 1.7% of the Gross National Product in the Netherlands was lost and approximately 93% of the cost of this caused by absence (Abledu & Abledu, 2012).Due to musculoskeletal disorder around 41.2 million adults in the United States came to be disabled in 1990 (Akrouf et al., 2010). Millions of workers were at risk of musculoskeletal disorders as they made computer based activity by using monitor, keyboard or mouse frequently for long time sitting or awkward posture without having adequate relaxing time (Waersted et al., 2010).

It was proved by Sweden, USA, Germany, Estonia, Japan, Malaysia, Philippines,France and Greece that a great incidence of MSD was renowned between 40% and 95% that is connected to other working groups.An occupational group like school teachers were seems to be a high prevalence of MSD (Erick & Smith, 2010).In Hong Kong teachers a cross sectional study had shown for neck (68.9%), shoulder (73.4%) and low back pain (59.2%).The sample of Hong Kong teachers presented considerably higher prevalence in all musculoskeletal complaints International studies on MSD among school teachers had reported a high prevalence of MSD among school teachers.A study of school teachers in Hong Kong, for example, found that 95.1% had experienced some form of pain in related with musculoskeletal disorder (Chong & Chan, 2010).

In a study carried out in Estonia which considered on physical activity, MSD and cardiovascular risk factors in male physical education teachers (PETs), 66.7% of teachers informed MSD in the

previous 12 months, related to 51.2% of PETs who reported MSD for the same period (Pihl et al., 2002). In more studies and 55% and 51.4% for school teachers in Brazil (Cardoso et al., 2009).

In a study of secondary school teachers in Hong Kong, the life-long prevalence of neck pain had been reported at 69.3%, within 12 month prevalence of 66.7%, and the prevalence after becoming a teacher being 59.7% (Chiu & Lam, 2007). Similar findings had been demonstrated in another Chinese study where secondary school teachers reported a life-long prevalence of neck pain as 68.2%, 64.4% for 12 months, and neck pain prevalence after becoming a teacher of 56.8% (Chiu et al., 2006).

In a more recent Chinese study school teachers reported a high neck pain prevalence rate of 68.9% for the previous month (Chan et al., 2010).

A randomized study in Malaysia, among 272 teachers found that the prevalence of low back pain was 39.6% for men and 48.1% for women and low back pain 47.8% in the rural areas, 46.3% in the urban areas and 40.2% in the industrial areas. 25.2% of the teachers experienced low back pain from prolonged sitting and 23.4% from prolonged standing (Samad et al., 2010).

Musculoskeletal symptoms were caused by multi-factorial different physical influences (Telci et al., 2011). Different socio-demographic factors such as age, gender, working conditions, and working hours were associated with developing musculoskeletal disorders (Telci et al., 2011). The highest prevalence of musculoskeletal pain among teachers was found in the 40 to 49 ages group (Sornaraj et al., 2012).

There were different patterns of musculoskeletal diseases among men and women (Darwish & Al-Zuhair, 2013). There were significant differences between the genders (Telci et al., 2011) and the prevalence of musculoskeletal symptoms was higher among females than males (NurulIzzahet al., 2010).

Most female teachers complained of pain when reaching overhead and this limited their activity (Telci et al., 2011). Female teachers were significantly at risk of developing lifelong neck and upper limb pain after join the teaching profession (Chiu & Lam, 2007). Pain in the neck, upper back, lower back and shoulders and the upper limb region were

common in female school teachers. Primary and high school teachers were risky occupational groups who were regularly affected by musculoskeletal symptoms. But despite all these studies, there was still scope to know symptoms, their severity and the implications for affected teachers (Geleceket al., 2011). Therefore, it was important to know the prevalence rate and risk factors of musculoskeletal symptoms among school teacher.

1.2 Justification of the study

Musculoskeletal disorders (MSD) represent one of the most common and important occupational health problems in working populations in both developed and developing countries. MSDs may cause a great deal of pain and suffering among afflicted workers. These were the most common lost time injuries and most costly occupational problems. Job activities that may cause MSDs span diverse workplaces. Workers experiencing aches and pains on the job may not be able to do quality work. MSD decrease productivity at work due to sick leave, absenteeism and early retirement and are also costly in terms of treatment and individual suffering. Moreover, MSD represent a common health-related reason for discontinuing work and for seeking health care. Some research has found that teachers are at risk for developing musculoskeletal disorders. The prevalence among them is not uniform.

School teachers, in general, have been demonstrated relative to other occupational groups, to report a high prevalence of MSD founded by some research. During the course of their work, teachers may be subjected to conditions that cause physical health problems. The work of a teacher does not only involve teaching students, but also preparing lessons, assessing students' work and being involved in the extracurricular activities such as sports. Teachers also participate in different school committees. These may cause teachers to suffer adverse mental and physical health issues due to the variety of job functions. The work tasks of school teachers often involves significant use of a 'head down' posture, such as frequent reading, marking of assignments, and writing on a blackboard. Nursery school teachers, however, also perform a wide variety of tasks combining basic health childcare and teaching duties, and those that require sustained mechanical load and constant trunk flexion. Despite this, the impact of MSD specifically within the teaching profession has not been given sufficient attention in the literature.

Some factors such as gender, age, length of employment and awkward posture have been associated with higher prevalence rates that may cause musculoskeletal disorder.

Many studies have provided evidence of musculoskeletal symptoms among various groups of working population, but in Bangladesh few researches have studied about the relationship between MSD and teachers. In Bangladesh the teaching professionals has

high risks of MSD in work area but the amount of study in Bangladeshi teaching professionals related with agronomical risk levels based study is very few.

This study is very helpful for Physiotherapist and other professionals to know the exact prevalence of musculoskeletal disorders and identifying the factors associated with the occurrence of these musculoskeletal symptoms can help to develop ergonomic recommendations for the teaching profession in Bangladesh.

1.3 Research Question

What are the common work related musculoskeletal disorders and its associated factors among the school teacher at savar?

1.4 Objectives of study

1.4.1 General objective

To identify the work related musculoskeletal disorder among the school teacher at Savar.

1.4.2 Specific objective

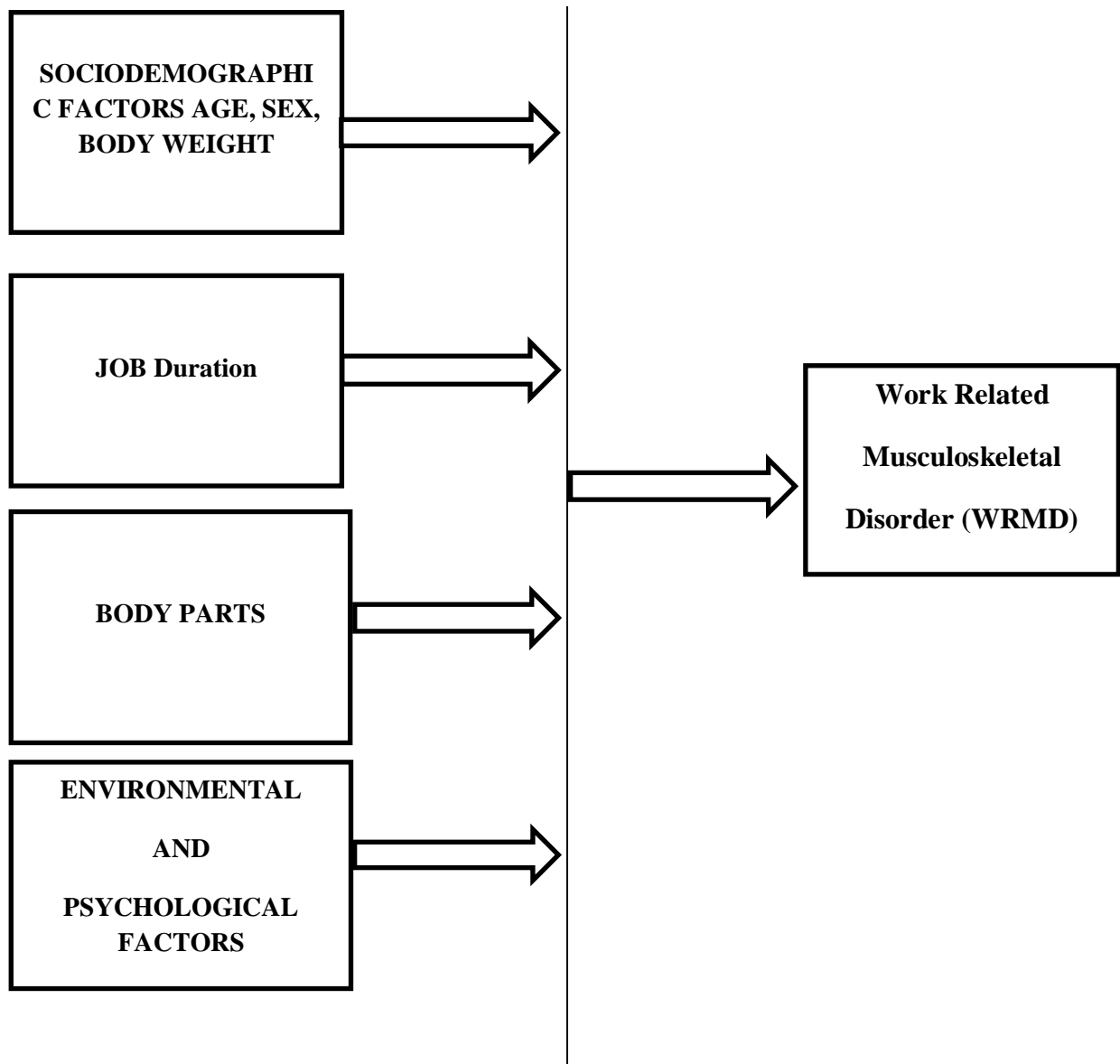
- To find out the socio demographic factors.
- To find out the associated physical risk factors of musculoskeletal symptoms among school teachers in Bangladesh.
- To identify medical information
- To find out the most affected body part.
- To identify the environmental factors
- To find out the psychological factors
- To identify the association between environmental factors and musculoskeletal disorders.
- To identify the association between psychological factors and musculoskeletal disorders.
- To identify the association between socio demographic factors and musculoskeletal disorders.

1.5 List of variable

Conceptual Framework

Independent variables

Dependent variable



1.6 Operational definition

Prevalence

The degree to which something is prevalent, especially the percentage of a population that is affected with a particular disease at a given time.

Work related musculoskeletal disorder

Work-related musculoskeletal disorder (WRMD) are the disorder of muscles, tendon, ligaments and nerves that develops due to work related factors such as repetitive work or activities with awkward posture with symptoms of pain, aches, parasthesias, tingling, numbness and stiffness etc. Some examples of musculoskeletal disorders include back pain, neck pain, carpal tunnel syndrome, tendinitis and tenosynovitis etc.

School teacher

School teachers are those who teach the students for their physical and mental development of their students. The teacher plays a key role in transforming young children into a productive adult. Teachers are undoubtedly the role models for their students. School teachers are those under whose guidance the young child is developed into a mature human resource that play a key role in the development of the nation.

Musculoskeletal disorders are injuries of muscle, nerve, tendon, ligament, joint, cartilage, or spinal discs. In Musculoskeletal disorder, different body parts are affected. Such as, shoulder, arm, wrist, upper and lower back, knee, ankle etc (Dul & Weerdmeester, 2008). Musculoskeletal disorders are encompassing different conditions that are related with ergonomics risk factors and develops insidiously and recuperates slowly (Sanders, 2008). Musculoskeletal disorders are related to the intensity and duration of work, working nature (Sanders, 2008).

“Musculoskeletal disorders (MSD) are injuries and complaints of the musculoskeletal system where as exposure to various risk factors is existing in the workplace may have either contributed to the disorders' development, or provoked a pre-existing condition. The Musculoskeletal disorder is the disorder of the muscles, joints and bones of the body. This disorder causes pain and it limits movement of human body. Musculoskeletal disorders can vary in severity from mild, periodic symptoms to severe, chronic and devastating conditions. Symptoms like aching, burning, cramping, loss of color, numbness, swelling, pain, stiffness, tingling and weakness occur in emerging stage of this disorder. When the musculoskeletal disorder affects a person for an extended period of time it causes many kinds of bone complications to person (Mesaria & Jaiswal, 2015).

Work related musculoskeletal disorder (MSD) include a wide range of inflammatory and degenerative conditions affecting the muscles, ligaments, tendons, nerves, bones and joints; and can occur from a single or cumulative trauma (Allsop & Ackland, 2010; Atlas et al., 2007). Musculoskeletal disorder decline efficiency at work due to sick leave, absenteeism and early retirement (Cardoso et al., 2009; Tsuboi et al., 2002) and are also costly in terms of treatment and individual suffering (Chiu et al., 2006). Moreover, MSD represent a common health related reason for discontinuing work and for seeking health care.

Common musculoskeletal disorders are Carpal Tunnel Syndrome, Muscle/Tendon strain, Ligament Sprain, Tendonitis, Thoracic Outlet Compression, Tension Neck Syndrome, Rotator Cuff Tendonitis, Epicondylitis, Radial Tunnel Syndrome, Digital Neuritis, Trigger Finger/Thumb, De-Quervain's Syndrome, Mechanical Back Syndrome,

Degenerative Disc Disease, Ruptured / Herniated Disc, repetitive motion injury, repetitive stress injury, overuse injury. Musculoskeletal disorders can affect all major areas of the body, including the neck, shoulders, wrists, back, hips, legs, knees and feet (Sanders, 2008).

When worker begin fatigue, it outruns their body's recovery system and develop a musculoskeletal imbalance. If fatigue help to outrun recovery and the musculoskeletal imbalance persists, it will cause to develop musculoskeletal disorder (Mesaria & Jaiswal, 2015).

Occupational Safety and Health Administration reported that musculoskeletal disorder is a condition which must have persisting symptoms (pain, paresthesias, numbness, discomfort) or there must be one or more physical findings (redness, loss of motion, deformity, swelling) (Sanders, 2008).

Pain originating musculoskeletal system and it is physical feelings cause by injury (Walter, 2008).A continuous pain which unpleasant but not strong. It is used in combination with parts of the body to means continuous pain in the stated part (Walter, 2008).A feeling of being uncomfortable physically or mentally, or something that causes short sleep during the day (Walter, 2008).

Numbness describes a loss of sensation or feelings in a part of body (Walter, 2008).

According to the world health organization (WHO) there are 150 million computer users worldwide. For doing computer based activity a person needs to be more deskbound and required more mental attention than non-computerized service holders (Johnstone et al. 2010).

Work related musculoskeletal disorders are associated with many factors that are mentioned below-

Improper working posture and movement, forceful exertion, repetitive work, imbalanced temperature, inadequate breaks (Sanders, 2008)

According to the National institute for occupational safety and health, American conference of governmental industrial Hygienists and most researchers recognizes the following factors as physical risk factors like repetition, force, awkward posture, static

posture, dynamic factors such as velocity of movement, mechanical compression, vibration and cool temperature etc. (Rice, 2008).

Force is the mechanical effort required to carry out a movement or to prevent movement. Force may be exerted against a work piece or tool, or against gravity, to stabilize body segments (Sanders, 2008). The force that a worker exerts on an object is a primary risk factor. Muscles and tendons can be overloaded when a strong (high) force is applied against the object load (Rice, 2008). The dynamic act of lifting a work piece and the static act holding that piece in position both require force, generated by muscles, transmitted through tendons and exerted by body segments on the work piece (Sanders, 2008) workers need force for doing their activity and excessive force can cause muscle fiber damage Performing job by doing forceful exertions of muscles will make them fatigue rapidly. The more force is applied, the more frequently the muscle will be fatigue or strained. Overuse of muscles through forceful exertions lead to strain or damage muscles, irritate tendons, joints and disks. The final result of excessive force leads to create inflammation, fluid build-up, and constriction of blood vessels and nerves in the area. Disorders of nervous system such as carpal tunnel syndrome and other nerve entrapment disorders can occur through increased compression on nerves (Walter, 2008).

More force equals more muscular effort, and consequently, a longer time is needed to recover between tasks. Since in repetitive work, as a rule, there is not sufficient time for recovery, the more forceful movements develop fatigue much faster . A risk can also occur when a weaker (low) force is applied repeatedly (repetition) or continuously over a long period of time. The combined effect of excessive force and repetitive movement has been suggested to be considerably more injurious than either factor alone. Studies have demonstrated that high repetition of negligible force applied to the same muscle group, joint or tendon causes inflammation of soft tissues (Jacobs, 2008).

Lifting and carrying are not the only task that requires high force but there are some jobs such as computer typing needs high force. Different jobs that require employees to apply pinch forces with their fingers (picking up or placing small items on an assembly line with the fingers), static forces (applying a lot of physical effort to put the last turn on a screw, pulling hard on a 30-inch wrench to loosen a bolt), and dynamic force (Mesaria &

Jaiswal, 2015). The musculoskeletal problems associated with repetitive work have become a concern to certain occupational groups such as computer users (Sanders, 2008). Keyboard operators exert peak forces in the range of 2 to 3 N, approximately three to nine times more than the force required to activate the key. The use of this amount of force means that keyboard keys are moved downward to their limit (Jacobs, 2008). Long duration of keyboard and mouse use may result in repetitive motion & high force (Johnston et al. 2008). Office workers with greater frequent and severity exerted higher levels of key force while typing than those who reported fewer and less severe symptoms (Jacobs, 2008). Although no one really knows when WMSDs will develop, workers performing forceful movements are at risk. Work involving forceful movements is very tiring again because there is not time for a full recovery between movements. Eventually it takes effort to perform the same task. When the work activity continues in spite of the developing fatigue, injuries occur (Johnston et al. 2008).

Repetition refers to the performance of the same motions over and over with in a given period of time (Sanders, 2008). Repetition is reported as a risk factor in itself or as an exposure. A moderate level of repetition may be seen as proactive, since it can increase muscle strength and flexibility. It can also assist blood flow through muscles, thus relieving the stressful nature of static muscle contractions (Sanders, 2004) Studies have demonstrated that high repetition of negligible force applied to the same muscle group, joint or tendon causes inflammation of soft tissues (Jacobs, 2008) Many jobs that involve repetition of the same job again and again are apparent even upon cursory observation: assembly line jobs where motions are repeated every few seconds, data processing jobs, directory assistant operators, court reporting, letter and package sorting. Tasks requiring highly repetitive movements with the combination of force and fixed body position are extreme risk factors for work-related musculoskeletal disorders (Sanders, 2008). It is difficult to judge movements as either it is high or low in repetition. If the cycle time of an activity is 30 seconds or less then it will be recognized as repetitive work (Middleworth, 2014).

Evidence in the Health Effects section shows a strong association between the occurrence of MSDs and jobs involving exposure to repetitive motions. The joints are most

susceptible to repetitive motion injuries, especially the wrists, fingers, shoulders, and elbows. Repetitive work that is done with the foot (operating foot activated controls) or knees (climbing ladders or using a carpet kicker) may also result in an MSD (Jacobs, 2008).

Performing motions constantly without short pauses or breaks Jobs that do not provide short pauses or breaks between motions or task cycles are often a problem because there may not be adequate time for muscles to recover from the effects of the exertion before the motion must be repeated (Sanders, 2008). If there are no pauses between motions or the pauses are too short, the muscles cannot recover to the rested condition. Thus, the effects of the forces on the muscles accumulate and the muscles become fatigued and strained. The lack of adequate recovery time often occurs in jobs involving highly repetitive tasks. This happens when task cycle lengths are very short, which also means that the job involves a high number of cycle repetitions per minute. For example, some research shows that tendons and muscles in the wrists may not be able to recover where repeated task cycles are less than 5 seconds in length, that is, they are repeated more than 12 times per minute. Jobs involving constant muscle activity also may not provide adequate recovery time (Johnston et al. 2008).

These types of jobs may involve continuously holding hand tools (knife, paint brush, staple gun), which means that employees have constant exposure to static postures and low contraction forces (Sanders, 2008). The longer motions or job tasks are performed, the less likely that there will be adequate recovery time. Any part of the musculoskeletal system involved in moving the body is subject to injury where there is inadequate recovery time, and the recovery times needed vary by body part. For example, although employees may not be at high risk for forearm injury if task cycles are 25 seconds long or not repeated more than 3 times per minute, they may be at high risk of shoulder injury under this regimen (Jacobs, 2008).

Posture is one of the most frequent risk factor for developing musculoskeletal It is the position of the body including arms and legs while working. Bad or awkward postures mean that joints must be held beyond their comfortable, neutral position, and close to the

extreme end of their maximum range of movement. Remaining in the same posture for too long is also inadvisable (Sanders, 2008).

Awkward posture is the primary ergonomic risk factor to which employees are exposed when the height of working surfaces is not correct. Awkward postures involve working in a position that is deviated from neutral position (Middles worth, 2014). It brings the body out of alignment and is less efficient and effective position than neutral posture. All joints move through a special range of motion. Postures in the middle of the range of motion are generally considered as neutral postures whereas postures at the end of the range can be considered as awkward posture (Sanders, 2008).

When performing any work by doing long reaching, it may significantly alter the positions of shoulders, elbows and backs from the neutral position. Bent shoulder, neck, wrist, raised arm, bent and twisted trunk are some examples of poor posture. This kind of awkward posture places excessive force on joints and overload the muscle and tendon around the joint which may lead to occur work-related musculoskeletal disorders (Middles worth, 2014).

In an awkward posture, muscles and tendons cannot work appropriately and thus they need much more force to complete tasks. This additional force increase stress on muscles and tendons, increase pressure on nerves and blood vessels and reduce blood pressure to the affected area (Dul & Weerdmeester, 2008).

A work station that is too high or low will involve the workers to work in an awkward posture. In different offices or banks, most of the employees work in the surfaces that are not adjustable. Employees who have average height may be able to work comfortably but others having different height have to face many difficulties. Working surfaces that are too high usually affects the muscles of the upper limb specially muscles around the shoulder and elbow joint. On the other hand working surfaces that are too low usually affect the lower back and the neck (Dul & Weerdmeester, 2008).

Working for long time in the same position will make the workers feel "stiff, sore and tired. Static postures are those postures that are held over a long period of time that resist the force of gravity or stabilize a work piece or body part (Sanders, 2008). It involves a prolonged state of contraction during which no movements is being performed. During

static contractions, the internal pressure of muscle tissue compresses blood vessels and reduces blood flow to the muscle so that the oxygen and energy supply to the exertion and duration of forces (Dul & Weerdmeester, 2008).

Working with computer in static posture has been identified as major occupational risk factor. Prolonged sitting requires the muscles to hold the trunk, neck and shoulders in a fixed position. This squeezes the blood vessels in the muscles, reducing the blood supply. An insufficient blood supply accelerates fatigue and makes the muscles prone to injury (Jacobs, 2008).

Bending or twisting while manual handling creates an awkward posture and changes the way forces are distributed in the. When the spine is in its natural position, forces are directed along the bony structure and distributed into the tissue as the spine curves. However, bending and twisting redirects the forces, placing more compressive and shear forces on the discs (Dul & Weerdmeester, 2008).

Workers using poor work practices, body mechanics and lifting techniques are highly in risk of developing musculoskeletal disorders (Middlesworth, 2014). Such inappropriate practices cause unnecessary stress, increases fatigue and decreases body's ability to properly recover (Middle worth, 2014).Smoking, drink excessive alcohol or other poor health habits put the workers at risk for developing musculoskeletal disorders (Middles worth, 2014).

There are many workers who need to many hours at stretch and become fatigue. They donot get adequate rest time for the recovery of fatigue muscles which fall them in higher risk of occurring musculoskeletal disorders (Middles worth, 2014)

Workers who do not take care of their bodies, who are malnourished, dehydrated and poor level of physical fitness are putting themselves at a higher risk of developing musculoskeletal and chronic health problems (Facts, 2008).

Musculoskeletal impairments are among the most prevalent and symptomatic health problems of middle and old age. Another problem is that advancing age and increasing number of years on the job are usually highly correlated (Facts, 2008). Age is a true confounder with years of employment, so that these factors must be adjusted for when

determining relationship to work. MSD problems are even more common among older workers (Silva et al. 2013)

Some studies have found a higher prevalence of musculoskeletal symptoms in women than men (Silva et al. 2013; Facts, 2008). Women are exposed to repetitive biomechanical stresses on the upper limb more frequently than men. (Facts, 2008). In Taiwan female workers 39.5% had a significantly higher overall prevalence than male workers 35.2% (Das & Ghosh, 2010).

The environmental risk factors refers to temperature, enough lighting, good work environment, type of ventilation (dry, cold, unwanted or fresh air), type of environment of work (noisy, too bright) inside the office, location of screen or screen reflects the office light etc. (Eltayeb et al. 2007).

A very essential environmental factor is Temperature. Workers become tired quickly in an office that is too warm. An increase in temperature may create excessive sweating, reduce efficiency in both physical and mental tasks, rise in heart rate and blood pressure, and reduce digestive organ activity. Performance of the workers is also depended on cold temperature. In a cold environment blood vessels contract and posture becomes stiff. Workers may feel restless and become easily distracted in an office that is too cold (Sanders, 2008). When there is significant change in temperature, workers become tired quickly which fall then in risk to injuries. Job design such as workloads & hours of work, overtime, duration of time spent using the keyboard and mouse, workplace design such as desktop & chair height, legroom, keyboard & mouse surface, monitor height etc. have significant association with musculoskeletal disorders if it have any miasmas with the appropriate dimensions (Dul & Weerdmeester, 2008).

Ergonomics is the science of work. Ergonomics derives from two Greek words „,„, ergon““ meaning work and “nomos““ meaning laws. Ergonomics is the scientific study of people at work and their workplace. The working definition of ergonomics used by occupational health practitioners is simple: it is the study of how to fit work to the workers more generally, in everyday practice (Sanders, 2008). The science of studying people at work and then designing tasks, jobs, information, tools, equipment, facilities

and the working environment so people can be safe and healthy, effective, productive and comfortable (Eltayeb et al. 2009).

Ergonomics has come to mean the design of tool and equipment in both working and nonworking settings, to reduce the risk factors for musculoskeletal disorder (Sanders, 2008). The goal of ergonomics is to reduce stress and eliminate injuries and disorders associated with the overuse of muscles, bad posture, and repeated tasks. This is accomplished by designing tasks, work spaces, controls, displays, tools, lighting, and equipment to fit the employee's physical capabilities and limitations (Eltayeb et al. 2007). Computers and related products, such as computer desks and chairs, are frequently the focus of ergonomic design. A great number of people use these products for extended periods of time such as the typical work day. If these products are poorly designed or improperly adjusted for human use, the person using them may suffer unnecessary fatigue, stress, and even injury (Sanders, 2008).

School teachers may have a higher risk at developing MSDs because:

Their job often involves prolonged sitting and working in awkward postures. Much of their work is physically demanding, stressful and involves long working hours lot of seasonal workers are employed in this field that does not have time to adapt to the job.

Most of them have to work repetitively in front of computers without having adequate rest and recovery time. Poor work place design and lack of knowledge about ergonomic intervention. A lot of young workers are employed, who are not work hardened and havenot yet developed the skills required (Facts, 2008)

3.1 Study design

This study aimed to find out the work related musculoskeletal disorders among the Teacher. For this reason a quantitative research model in the form of a cross-sectional type survey in design is used. Cross-sectional study is selected because it is a snapshot of the frequency and characteristics of a disease in a population at a particular point of time (Levin, 2008). Cross-sectional research method is often used to utilize in many areas including social science and education. Cross-sectional studies are observational in nature and are known as descriptive research (Trochim, 2006). This type of study helps to find out the prevalence of acute or chronic conditions of a population. Researchers record information that is present in a population, but they do not manipulate variables (Levin, 2008). This type of study utilizes different groups of people who differ in the variable of interest and other characteristics such as socioeconomic status, educational background, and ethnicity (Trochim, 2006).

However, investigator wanted to find out the status of musculoskeletal symptoms among teachers at a point of time. Investigator also wanted to find out the risk factors among teachers at a short period of time. For this reason, the cross-sectional study was more appropriate design to fulfill the aim and objectives of this study.

3.2 Study sites

The sites of my study are some selected school which is-

- Savar Laboratory School
- Savar Model academy
- Savar Aced School

3.3 Study area

Musculoskeletal Conditions of the school Teacher&it's associated factors.

3.4 Study population and sampling

Study settings were the primary and secondary schools at Savarupzila of Dhakadistrict in Bangladesh. Non-government primary and secondary schools were selected for

conducting study. Investigator selected primary and secondary schools in same environmental context. The criteria of study population are determined from a literature review and the goals for the study. All teachers of Savar were considered as the study population.

In this research about 90 samples were selected randomly from the population for this study from Savar laboratory school, Savar Model Academy & Savar Aced school.

3.4.1 Sampling procedure of the study

The researcher use convenient sampling procedure to collect the samples. Convenient random sampling is a type of probability sampling in which the researcher consciously selects each and every number of the population has equal opportunity to be in the sample.

3.4.2 Inclusion criteria of the study

- Both male and female teacher will be selected- In this study, the investigator wanted to explore work related musculoskeletal disorders among the teacher (Allsop&Ackland, 2010).
- Full time government and non-government Primary and secondary School teachers with at least one year teaching experience were participated in this study.
- All age group are selected- as there is objective of the study to explore the relationship between age and work related musculoskeletal disorders, so samples are selected from all age group.
- Subject who are willing to participate in the study- Otherwise they will not give exact information that is helpful to the study (Atlas et al.,2007).

3.4.3 Exclusion criteria of the study

Participant was excluded if he or she had joint disease such as osteoporosis, osteoarthritis, soft tissue disease, any recent injury or trauma, residual disability such as polio, amputation etc, degenerative disc disease and pregnancy at the point of data collection period (Atlas et al., 2007).

3.5 Sample size

Sampling procedure for cross sectional study done by following equation-

$$n = \left\{ \frac{z \left(1 - \frac{\alpha}{2} \right)}{d} \right\}^2 \times pq$$

Here,

$$z \left(1 - \frac{\alpha}{2} \right) = 1.96$$

$p = 0.83$ (Here $p =$ prevalence and $p = 83\%$)

$q = 1 - p$

$$= 1 - 0.83$$

$$= 0.17$$

$d = 0.05$

So the researcher aimed to focus his study by 216 samples following the calculation Above initially. But as the study was done as a part of fourth professional academic Research project and there were some limitations, so the researcher had to limit with 90 school teachers as sample for this study.

3.6 Data collection method and tools

Data was collected through the face to face interview with participants and the researcher. Data was analyzed Microsoft office Excel 2010 using a SPSS 20 version software program. The tools that needed for the study were- Consent paper, questionnaire, paper, pen, file, calculator, and computer.

In this study data were collected by both structured and semi structured mixed type questionnaire. Mixed type questionnaire include both open and close ended questions. Following that the investigator was gone to school teacher to take permission if they are interested in this study or not. Firstly, the investigator introduced him and the research project as well its purpose. Then investigator met with individual subject to find out if they were interested in participating. For data collection, the investigator used only Bangla type of questionnaire but easiest wording. After that a date was fixed by the researcher to collect the questionnaire from the recipients.

Firstly, investigator gave information sheet and consent form to participants and described the purpose of study. When participants understood about study, they were prepared to response according to questionnaire. Most of participants gave information in teacher's room one by one. There had no volunteer to collect data. This questionnaire addressed teacher's work and health. Most of the questions were simply answered by yes or no. participant could not consult with their colleagues. They only marked one answer and were chosen the answer that in opinion is best.

3.7 Data analysis

The result of this survey was consisted of quantitative data. By this survey a lot of information was collected. All these results gave a basic idea about the work related musculoskeletal disorders among the school teacher in Bangladesh. The investigator used the raw data in SPSS to find out the percentage of sociodemographic factors, prevalence of musculoskeletal symptoms in nine body regions & associated physical risk factors. Moreover, investigator used frequencies in SPSS for finding the percentage of socio-demographic factors & prevalence of musculoskeletal symptoms in nine body regions.

If there is a relationship between two categorical variables, chi-square test for association will use to discover categorical variables. Therefore, Chi-square test (χ^2) was used to find out the statistic significant association between risk factors and musculoskeletal symptoms among teacher. Chi-square test was conducted at with $p < .05$, to find out the association between the prevalence of musculoskeletal symptoms and risk factors.

3.8 Informed Consent

The aims and objectives of this study should be informed to the subjects verbally. The researcher gave the consent form to the subject and explained them. The subjects had the rights to withdraw themselves from the research at any times. It should be assured the participant that her name or address would not be used. The information of the subjects might be published in any normal presentation or seminar or writing but they would not be identified. The participant will also be informed or given notice that the research result would not be harmful for them. It would be kept confidential. The researcher is to ensuring the confidentiality of participants' information, sharing information only with

the research supervisor. At any time the researcher will be available to answer any additional questions in regard to the study.

3.9 Ethical consideration

The researcher has permission from the research supervisor, physiotherapy Department. The study was followed by WHO and BMRC guidelines. All the participants and authority will be informed about the purpose of the study, the process of the study and their written consent will be obtained. All the interviews will be taken in a confidential to maximize the participant's comfort and feelings of security. The researcher is ensuring the confidentiality of participants' information, sharing information only with the research supervisor.

The aim of my research is to explore the prevalence of work related musculoskeletal disorders among the School teacher and their associated factors. Data were numerically coded and captured in Microsoft Excel to show the result, using an SPSS 20.0 version software program for analyze the data as descriptive statistics.90 participants were chosen to estimate the prevalence of work related musculoskeletal disorders among the School teacher.

4.1 Sociodemographic factors

Age of the participant

Analysis reveals that among the 90 participants lowest age were 21 years and highest age was 53 years. Among them 39 participants were in between 20-30 Years,34 participants were in between 31-40 Years,15 participants were in between41-50 Years And 2 participants were in between 51-60 Years.

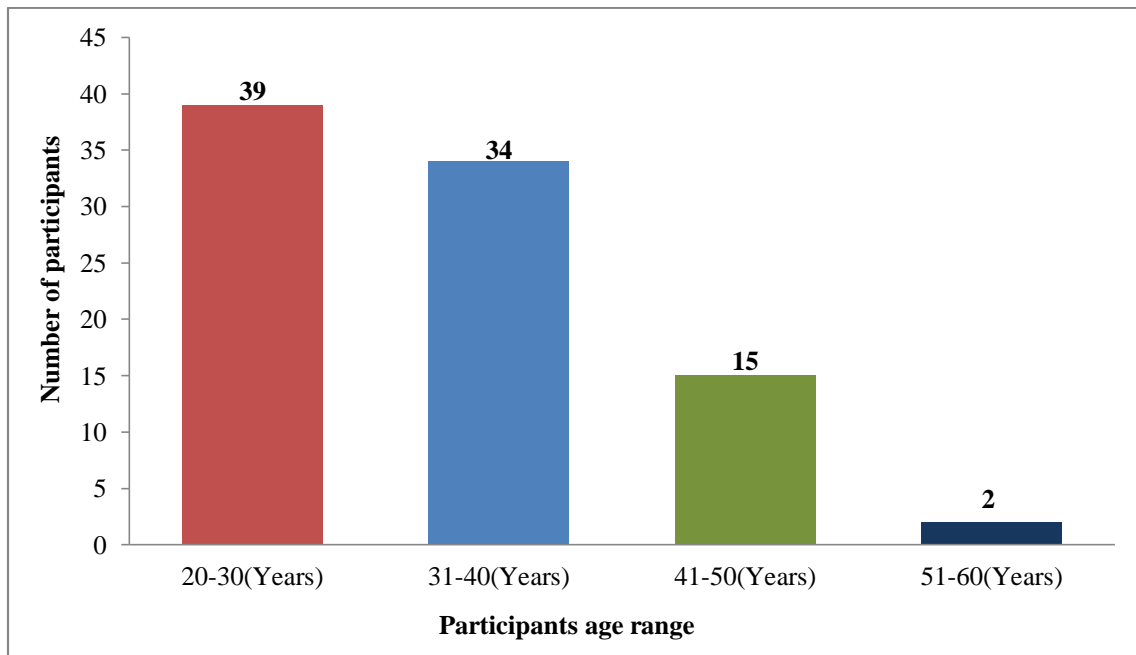


Figure1: Age of the participant

Gender of the participant

Analysis showed that among the 90 participants 50 were male and 40 were female and among the participants who were suffered from WRMD 56% were male and 44% were female.

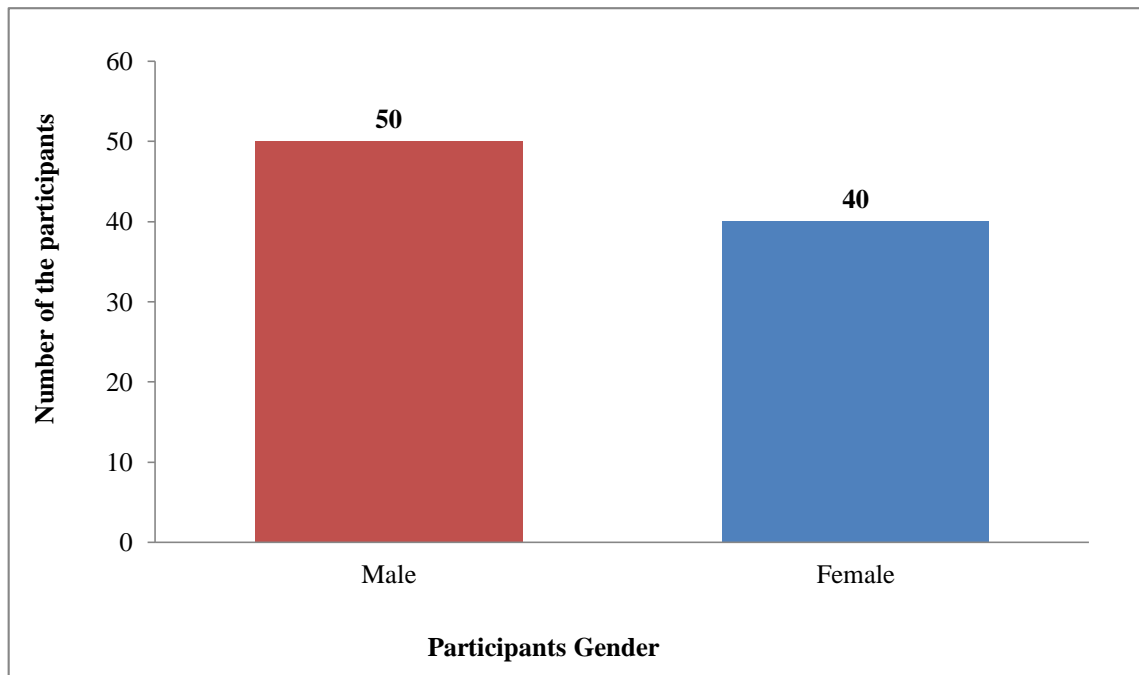


Figure 2: Male and female ratio

Educational level of the participant

Analysis showed that among the 90 participants about 3.3% participants educational level is H.S.C 41.1% is Honors& 55.6 % is Masters.

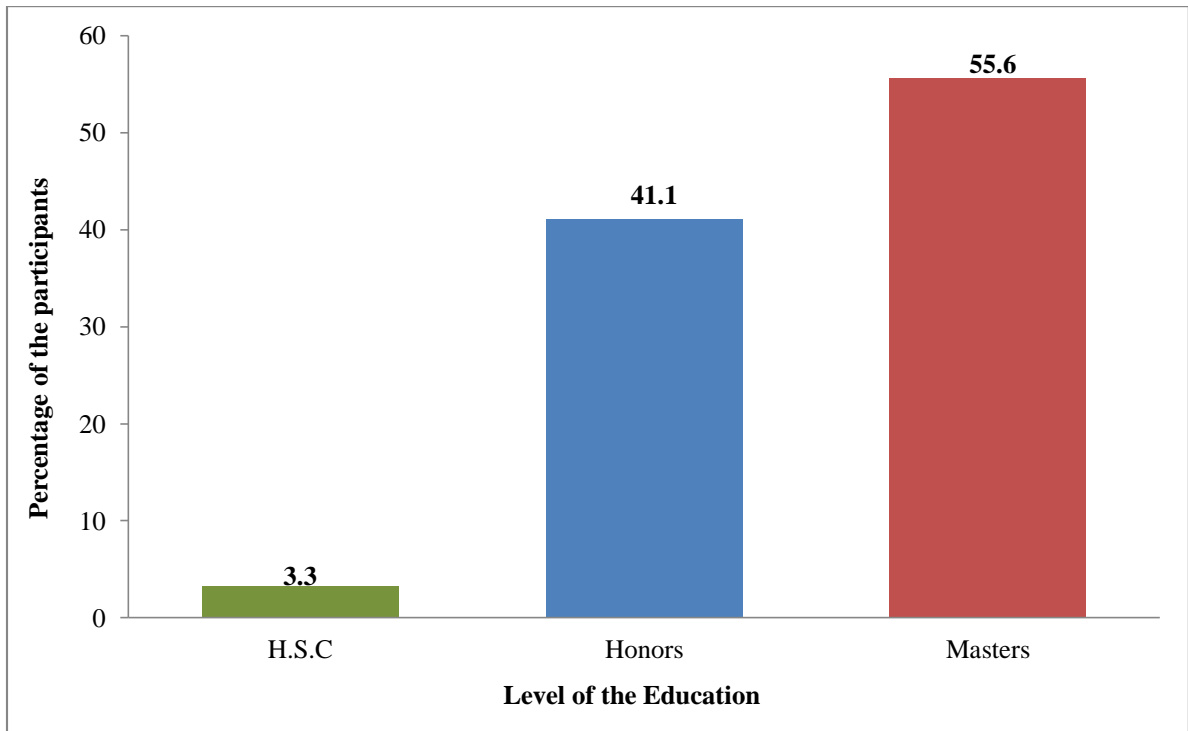


Figure 3: Educational level

Marital status of the participant

This study show that about 27.8 % teachers are single 68.9% married, 1.1% Divorce &2.2% Widow (Figure 3) and their mean value1.78.

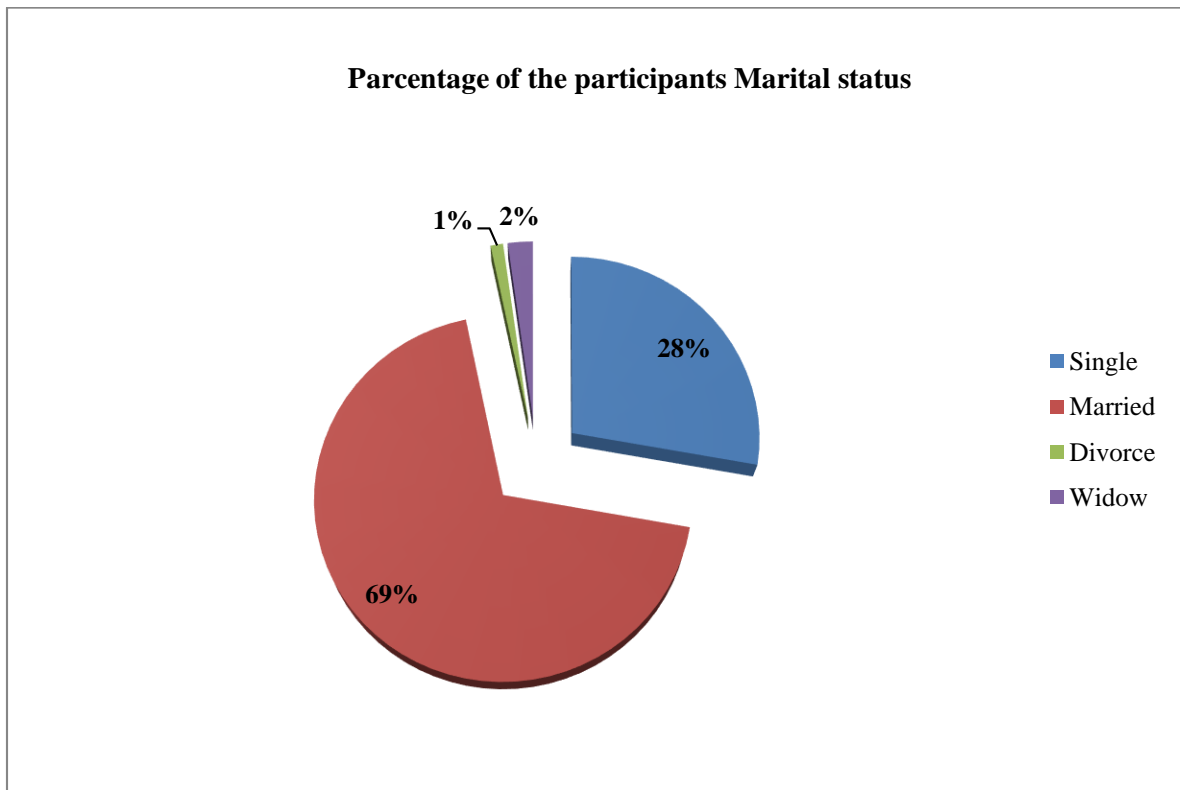


Figure 4: Marital status

Job duration of the participant (Years)

In this analysis the investigator categorized employment duration or working experience in (1-5), (6-10), (11-15) and (16-20); the percentage were 63.3%, 22.2%, 20.0%, 8.9%, 5.6% (Figure 3) and mean working experience 1.57, SD \pm .875.

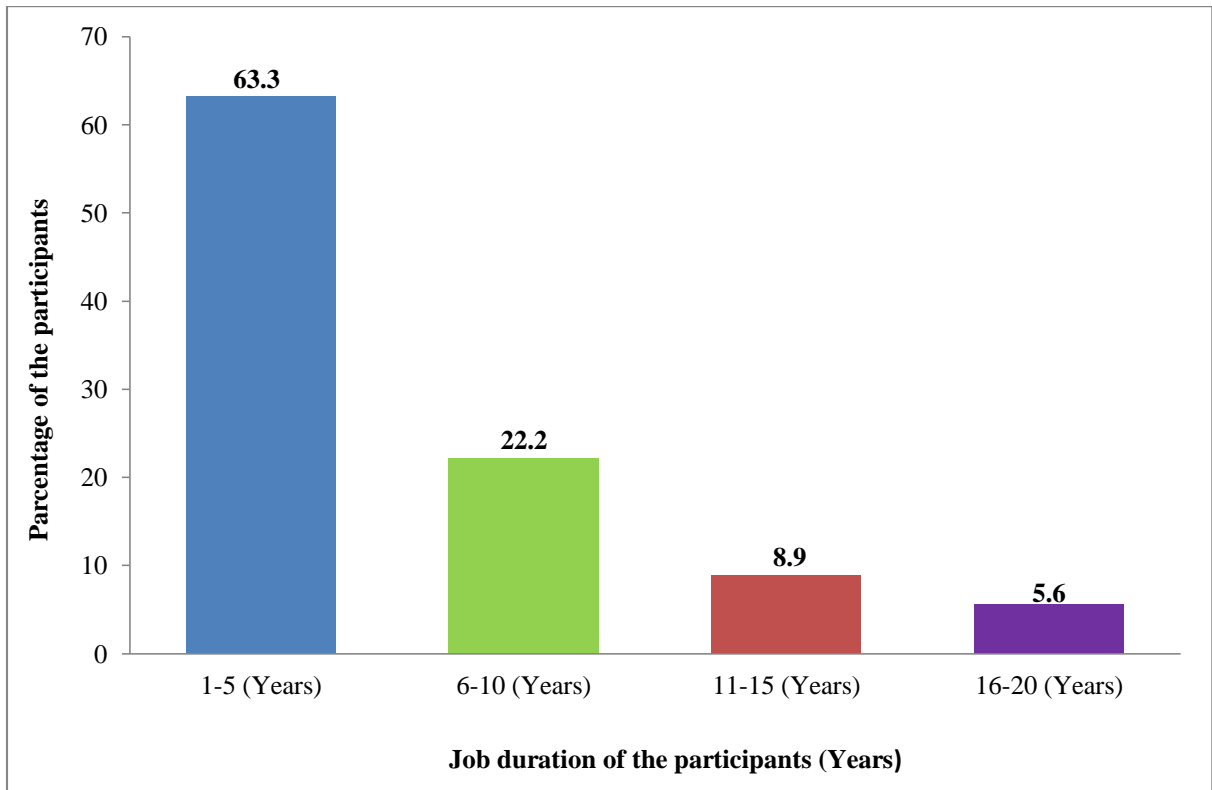


Figure 5: Job duration of the participant (Years)

4.2 Medical information

BMI of the participant

Analysis demonstrated that about 11 participants are underweight, 43 participants are in normal weight, 28 are overweight & 8 are obese.

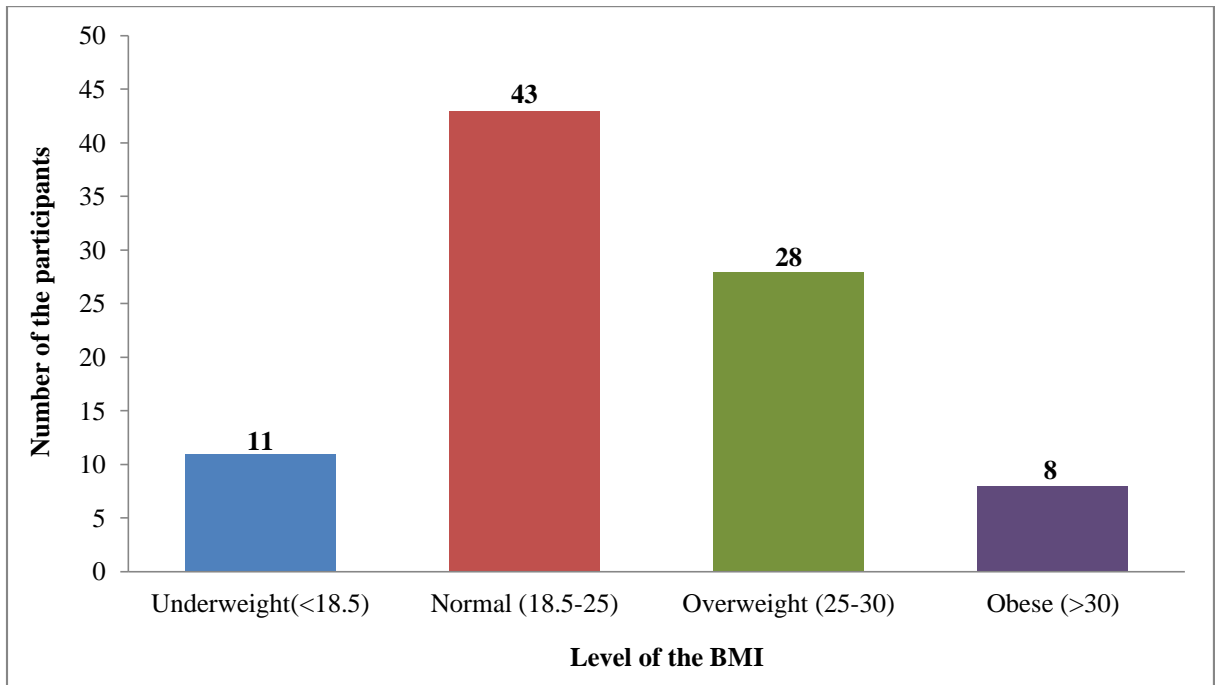


Figure 6:BMI of the participant

Existing Disease of the participant

Outcome demonstrated that among the participants 4% has Hypertension,9% has Diabetes mellitus& 87% teachers don't know about their existing disease.

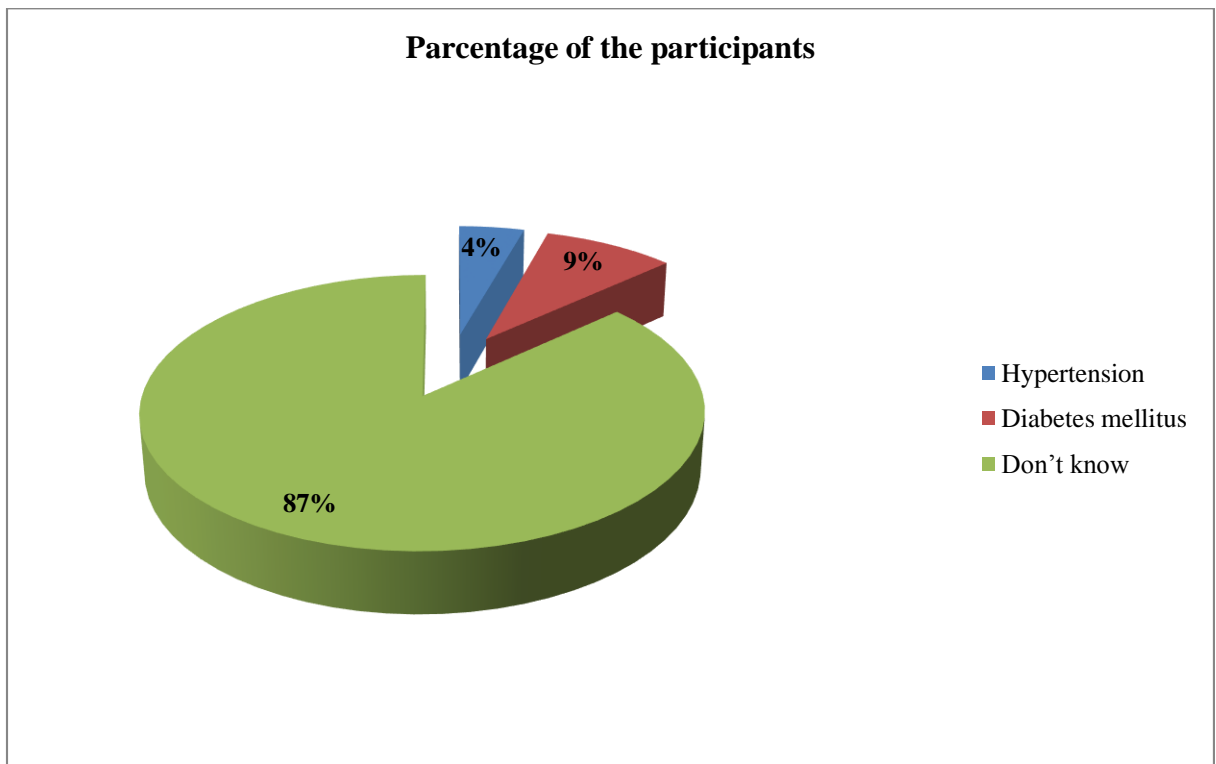


Figure 7: Disease of the participant

Tiredness after end of working day

This study show that about 6.7% participants are not tired ,64.4% participants are a bit tired & 28.9% are very tired after end of working day. Mean tiredness after end of working day is 2.22.

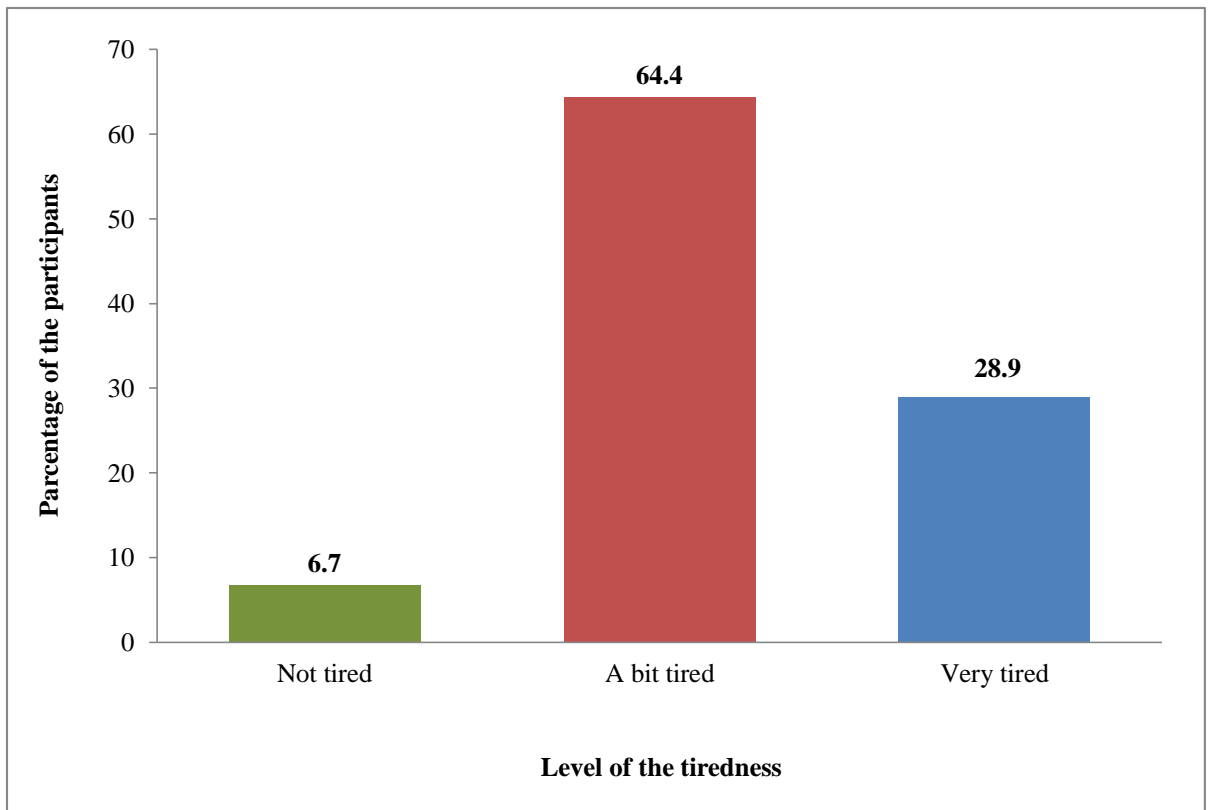


Figure 8: Tiredness after end of working day

4.3 Affected body area of musculoskeletal disorder

Affected body parts

After analysis researcher found that among the 90 participants who suffered from WRMD most affected body parts were Ankles in 47.8% participants, In Neck 33.3% participants ,In Thighs 34.4% participants, Knees in 27.8% participants, In Lower back 21.1% participants ,in upper back 17.8%& shoulder 17.8% participants, In wrist 11,1% participants And2.2% in elbows.

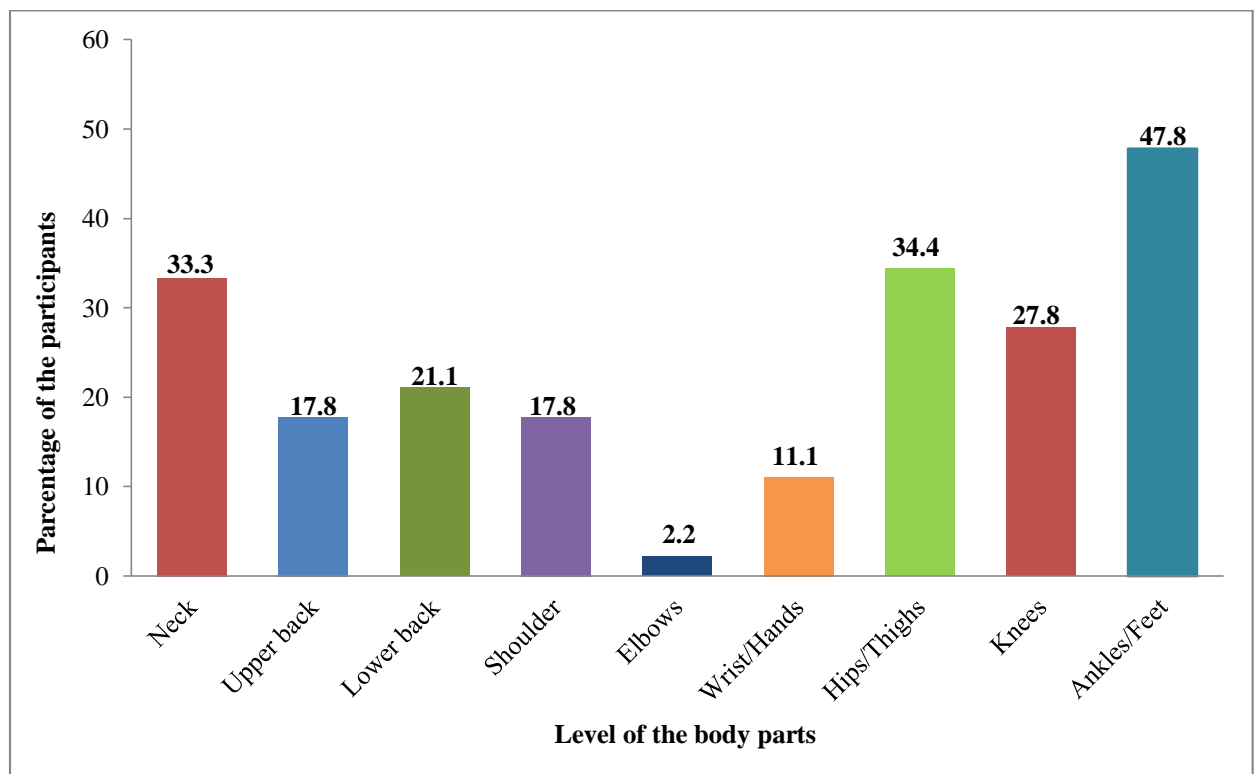


Figure 9: Affected body parts

Types of Musculoskeletal discomfort

Analysis demonstrated that from 90 participants about 58 participants are suffers from pain, 7 are suffers from parasthesia, 4suffers from tingling sensation & 21 are suffers from others discomfort.

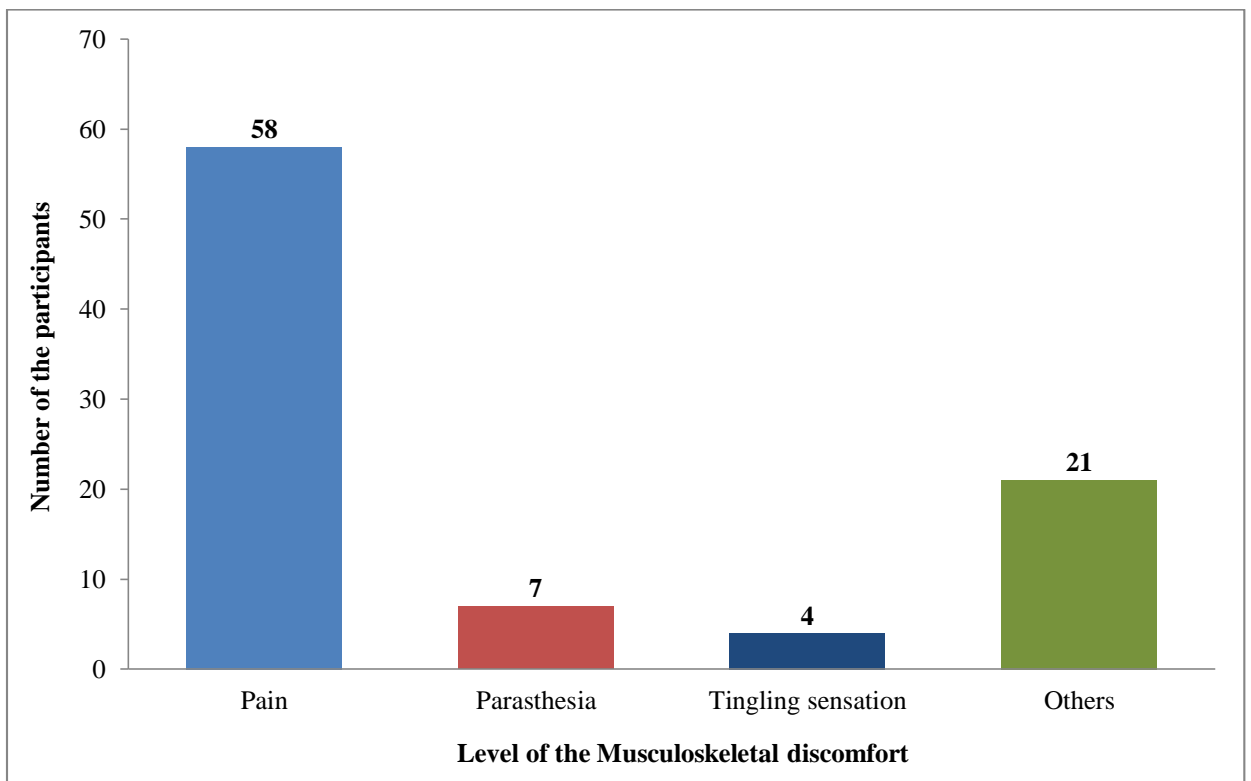


Figure 10:Types of Musculoskeletal discomfomrt

4.4 Environmental factors

Carrying out the same work almost the whole day same time

This study show that about 34 participants carry out the same work almost the whole working day and 56 participants is not carry out the same work.

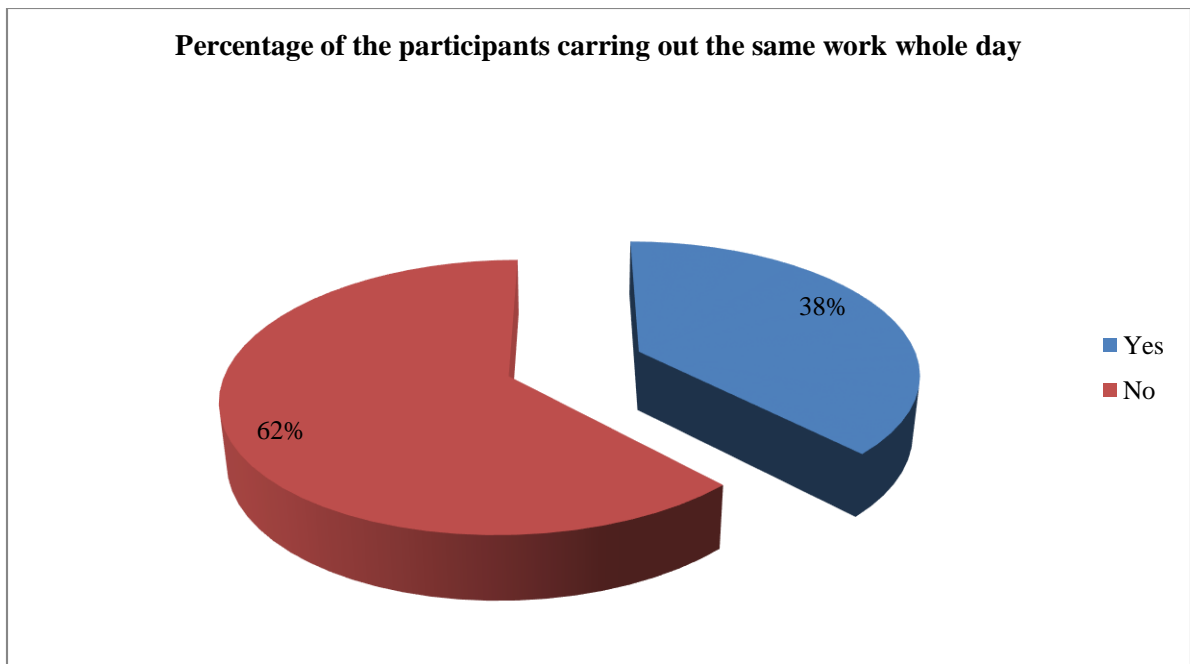


Figure 11:Carrying out the same work almost the whole day:

Types of posture during teaching

This study show that about 53.3% teachers are takes class in standing, 20% takes class in sitting, 17.8% takes in extended their arm/hand, & about 7.8% takes class in the same position for long periods.

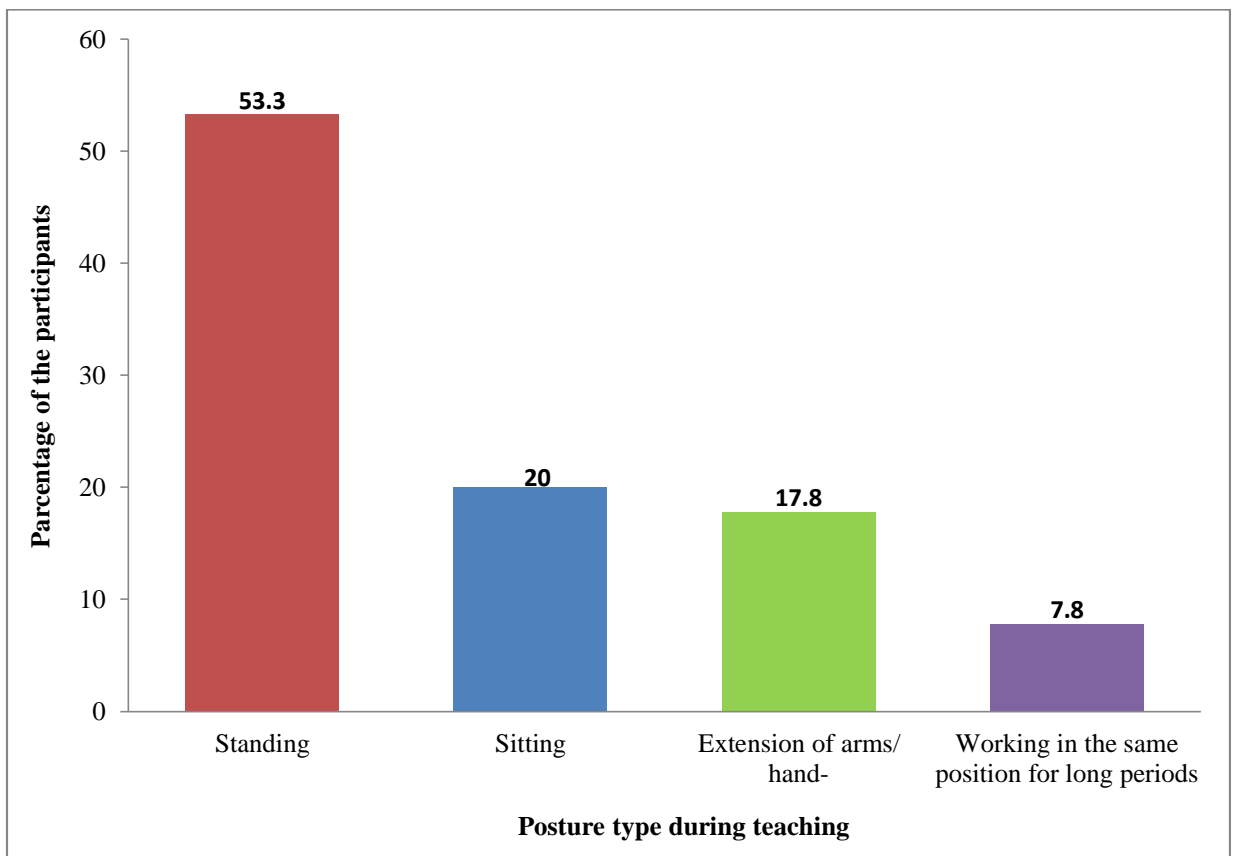


Figure 12: Types of work during teaching

4.5 Psychological Factor

Depression with Current job of the participant

Analysis demonstrated that from 90 participants about 14.4% participant is depressed with their current job and 1.1% is not under depression.

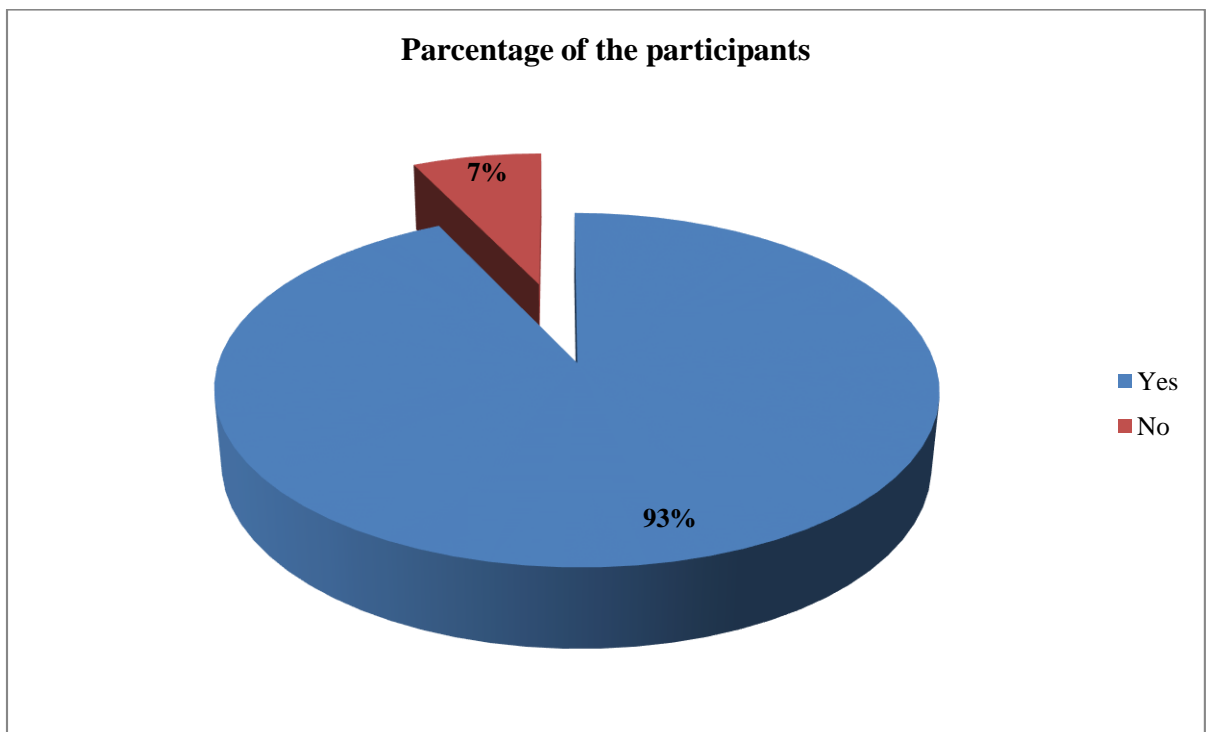


Figure 13: Depression with Current job of the participant

Association between Age and Musculoskeletal disorders in different body parts:

| Variables | Neck | Upper Back | Lower back | Shoulder |
|--------------|-------------|-------------|-------------|-------------|
| significance | 0.002 | 0.000 | 0.000 | 0.000 |
| Remarks | significant | significant | significant | significant |

| Variables | Elbows | Wrist | Thighs | Knees | Ankles |
|--------------|-------------|-------------|-------------|-------------|-----------------|
| significance | 0.000 | 0.000 | 0.003 | 0.000 | 0.673 |
| Remarks | Significant | significant | significant | significant | Not significant |

Table 1: Association between Age and Musculoskeletal disorders

This analysis show that Age of the participant has a significant ($P < 0.05$) association with Musculoskeletal disorder on different body part- Neck, Upper back, Lower back, Shoulder, Elbows, Wrist, Thighs and knees; accept ankles which is not significant ($P > 0.05$) with Age. This study assured that with the increasing of age musculoskeletal disorder also increase.

Association between Job duration and musculoskeletal disorders in different body parts:

| Variables | Neck | Upper Back | Lower back | Shoulder |
|--------------|-------------|-------------|-------------|-------------|
| significance | 0.002 | 0.000 | 0.000 | 0.000 |
| Remarks | significant | significant | significant | significant |

| Variables | Elbows | Wrist | Thighs | Knees | Ankles |
|--------------|-------------|-------------|-------------|-------------|-----------------|
| significance | 0.000 | 0.000 | 0.003 | 0.000 | 0.673 |
| Remarks | Significant | significant | significant | significant | Not significant |

Table 2: Association between Job duration and musculoskeletal disorders

In this analysis Job duration is highly significant ($P < 0.05$) with musculoskeletal disorders in different body parts- Neck, Upper back, Lower back, Shoulder, Elbows, Wrist ,Thighs, Knees accept Ankles.

Association between BMI and Musculoskeletal disorders in different body parts:

| Variables | Neck | Upper Back | Lower back | Shoulder |
|--------------|-------------|-------------|-------------|-------------|
| significance | 0.002 | 0.000 | 0.000 | 0.000 |
| Remarks | significant | significant | significant | significant |

| Variables | Elbows | Wrist | Thighs | Knees | Ankles |
|--------------|-------------|-------------|-------------|-------------|-----------------|
| significance | 0.000 | 0.000 | 0.003 | 0.000 | 0.673 |
| Remarks | Significant | significant | significant | significant | Not significant |

Table 3: Association between BMI and Musculoskeletal disorders

This analysis show that BMI of the participant has a highly significant ($P < 0.05$) association with Musculoskeletal disorder on different body part- Neck, Upper back, Lower back, Shoulder, Elbows, Wrist, Thighs and knees; accept ankles which is not significant ($P > 0.05$) with BMI.

Association between Tiredness after end of working day and Musculoskeletal disorders in different body parts:

| Variables | Neck | Upper Back | Lower back | Shoulder |
|--------------|-------------|-------------|-------------|-------------|
| significance | 0.002 | 0.000 | 0.000 | 0.000 |
| Remarks | significant | significant | significant | significant |

| Variables | Elbows | Wrist | Thighs | Knees | Ankles |
|--------------|-------------|-------------|-------------|-------------|-----------------|
| significance | 0.000 | 0.000 | 0.003 | 0.000 | 0.673 |
| Remarks | Significant | significant | significant | significant | Not significant |

Table 4 :Association between Tiredness after end of working day and Musculoskeletal disorders

In this analysis tiredness after end of working day is highly significant ($P < 0.05$) with musculoskeletal disorders in different body parts- Neck , Upper back , Lower back, Shoulder, Elbows, Wrist , Thighs and Knees accept Ankles.

Association between Carrying out the same works the whole day and Musculoskeletal disorders in different body parts:

| Variables | Neck | Upper back | Lower back | Shoulder |
|--------------|-------------|-------------|-------------|-------------|
| significance | 0.002 | 0.000 | 0.000 | 0.000 |
| Remarks | significant | significant | significant | significant |

| Variables | Elbows | Wrist | Thighs | Knees | Ankles |
|--------------|-------------|-------------|-------------|-------------|-----------------|
| significance | 0.000 | 0.000 | 0.003 | 0.000 | 0.673 |
| Remarks | Significant | significant | significant | significant | Not significant |

Table 5 :Association between Carrying out the same works the whole day and Musculoskeletal disorders

This analysis show that Carrying out the same work the whole day of the participant has highly significant ($P < 0.05$) association with Musculoskeletal disorder in different body part- Neck, Upper back, Lower back, Shoulder, Elbows, Wrist, Thighs and knees; accept ankles which has not significant ($P > 0.05$) effect with carrying out same work.

Association between Types of work during teaching and Musculoskeletal disorders in different body parts:

| Variables | Neck | Upper back | Lower back | Shoulder |
|--------------|-------------|-------------|-------------|-------------|
| significance | 0.002 | 0.000 | 0.000 | 0.000 |
| Remarks | significant | significant | significant | significant |

| Variables | Elbows | Wrist | Thighs | Knees | Ankles |
|--------------|-------------|-------------|-------------|-------------|-----------------|
| significance | 0.000 | 0.000 | 0.003 | 0.000 | 0.673 |
| Remarks | significant | significant | significant | significant | Not significant |

Table 6: Association between Types of work during teaching and Musculoskeletal disorders

In this analysis Types of work during teaching is not significant ($P < 0.05$) with musculoskeletal disorders in different body parts- Neck , Upper back , Lower back, Shoulder, Elbows, Wrist , Thighs.

Association between Depression with Current job and musculoskeletal disorders in different body parts:

| | | | | |
|--------------|-------------|-------------|-------------|-------------|
| Variables | Neck | Upper back | Lower back | Shoulder |
| significance | 0.002 | 0.000 | 0.000 | 0.000 |
| Remarks | significant | significant | significant | significant |

| | | | | | |
|--------------|-------------|-------------|-------------|-------------|-----------------|
| Variables | Elbows | Wrist | Thighs | Knees | Ankles |
| significance | 0.000 | 0.000 | 0.003 | 0.000 | 0.673 |
| Remarks | Significant | significant | significant | significant | Not significant |

Table 7: Association between Depression with Current job and musculoskeletal disorders

This study show that depression with Current job of the participant is highly significant ($P < 0.05$) with musculoskeletal disorders in different body parts- Neck, Upper back, Lower back, Shoulder, Elbows, Wrist , Thighs and Knees accept Ankles.

High prevalence of musculoskeletal symptoms among different working population is commonly reported in different study. In addition, scarcity of evidence in identification of risk factor responsible to develop musculoskeletal symptoms.

Therefore, this study was conducted to identify the prevalence and associated risk factor among school teachers. The study found expectedly a high prevalence of musculoskeletal symptoms among school teachers during their work. In this study, developing musculoskeletal symptoms in different body area- In Neck is 33.3% , in Lower back is 21.1% participants ,in upper back 17.8% ,in shoulder 17.8% , In wrist 11,1%, in elbows 2.2%, In Thighs 34.4%, Knees in 27.8% and in ankles 47.8%.

Several study in other country showed a great portion of school teachers reported musculoskeletal symptoms. Among 893 teachers, the prevalence of neck pain and lower back pain were 48.7% and 45.6% (Li et al., 2012).

A study of Turkey, among 463 participants, 51.4% teacher reported musculoskeletal pain in at least 1 region and 42.5% for neck, 36.9% for upper-back, 43.8% for lowerback, 28.7% for shoulder, 8% for elbow, 13.4% for wrist, 8.4% for hip, 32% for knee and 21.8% for ankle (Telci et al., 2011).

Similarly, a cross-sectional analytic research of Thailand, among 452 participant, the prevalence of musculoskeletal symptoms were low back pain 54.4%, shoulder 41.6%, upper back pain 36.1%, neck pain 34.5% and arm pain 27.9%, respectively (Chaiklienga&Suggaravetsirib, 2012). Another study of Turkey, among 531, a large proportion of teachers reported musculoskeletal symptoms at lower back 48.4%, upper back 42.6%, neck 41.4%, shoulders 37.1%, wrists/hands 23.9%, knees 18.6%, elbows and hips/thighs 13.2%, ankles/feet 7.3% (Gelecek et al, 2011).

Moreover, the study of Australia found that the higher prevalence of developing musculoskeletal symptoms was 83.3% in the previous 12 months among teachers and affected body parts were neck, upper back, shoulder, knee and ankle/feet (Erick & Smith, 2014). A study of Saudi showed that Prevalence of musculoskeletal symptoms was

79.17% and most common body regions were lower back 63.8%, shoulder 45.4%, neck 42.1%, leg 40.0%, wrist 16.2%, and elbow joint 10.0% (Darwish&AlZuhair, 2013).

Another study of Mangalore, the higher prevalence of musculoskeletal pain was 99.6% among school teachers during the past 12 months (Bhat, 2013). Neck pain 66.1%, low back pain 61.8%, knee pain 32.0% and shoulder pain 25.9% were the most prevalent musculoskeletal complaints of school teachers (Bhat, 2013).

Besides, a study of Hong Kong, the prevalence musculoskeletal symptoms in Shoulder pain 73.4%, neck pain 68.9% and lower-back pain 59.2% (Chong & Chan, 2010). In this study, investigator found the high prevalence of developing musculoskeletal symptoms was female than male. Similarly, developing musculoskeletal symptoms was higher than male in different study (Chaiklienga&Suggaravetsirib, 2012).

In this study, investigator find highly significant association between sociodemographic factors or general factors such as age, gender, employment duration, and also association between medical information such as- body mass index and physical tiredness at the end of a working day with musculoskeletal Symptoms.. But there had shown association between demographic factors and musculoskeletal symptoms in different study.

Darwish& Al-Zuhair (2013) stated that there has significant relationship of type of, school, age, weight, number of children, shoe type, teaching years, and working daily hours with musculoskeletal symptoms. In another study, female gender and age were associated with developing musculoskeletal symptoms (Erick & Smith, 2014).

In this study the investigator found that study participants often standing for long periods, sitting for long periods, Extension of arms/ hand ,Working in the same position for long periods, Doing repetitive tasks many times Stretching to write on high boards during work. Teachers are mostly working in sitting, standing and need to stretch on boards for writing (Chaiklienga&Suggaravetsirib, 2012).

A study of Thailand, researcher found that the working postures of teachers were prolonged standing or sitting, working in awkward posture, writing with the elevated arm on the board which was risk factor to develop musculoskeletal symptoms (Gelecek et al, 2011).

Different study suggested that physical factors, rapid physical activity and awkward arm position were positively associated with musculoskeletal disorder (Erick and Smith, 2014;Gelecek et al, 2011). Prolonged standing and sitting, static posture and uncomfortable back support are associated with lower back pain (Samad et al. 2010). Prolonged standing has been closely associated with neck/shoulder pain (Erick & Smith, 2013).

Another study of Chine reported that developing of neck pain associated with working in forward bending of head for long time of school teachers (Chiu & Lam, 2007). Awkward arm position is associated with shoulder pain (Erick & Smith, 2014).

In this study, there had a significant association between Psychological Factor such as-job depression with musculoskeletal disorders.

Various studies have reported that poor psychosocial factors were potential risk factors for MSD. In a Chinese study of secondary school teachers, low colleague support and high workload have been significantly associated with neck pain. Other studies have also demonstrated a significant association of psychosocial factors and MSD.,Furthermore, psychosocial factors such as mental health among Malay school teachers and anxiety among Chinese teachers (OR: have been associated with higher MSD prevalence rates (Erick & Smith,2013).

Though the expected sample size was 216 for this study but due to resource constrain researcher could manage just 90 samples which is very small to generalize the result for the wider population of the school teacher because of time limitation & unavailable participant. There are a no literatures about work related musculoskeletal disorders among the school teacher in the perspective of Bangladesh so it is difficult to compare the study with the other research. The researcher was able to collect data only from 3 selected school for a short period of time which will affect the result of the study to generalize for wider population.

In Bangladesh, there is no actual information about the musculoskeletal symptoms prevalence and associated physical risk factors among school teacher. Therefore, this study discover the prevalence of musculoskeletal symptoms with most affected body parts & associated risk factors of musculoskeletal symptoms among school teacher in Bangladesh. In addition, determine the association between musculoskeletal symptoms (MSS) with socio-demographic factors and physical factors.

This study found a high prevalence of musculoskeletal symptoms and respondent reported musculoskeletal symptoms in different parts of the body. In these studies the most affected area were Ankle, Thigh and Neck & others regions are affected respectively. Teacher were involved awkward posture in back, neck, arm etc during work as well as uncomfortable position that are potentially associated with developing musculoskeletal symptoms. Work related musculoskeletal symptoms impact in physical and mental health, individual work as well as quality of life.

The study result suggested that to prevent musculoskeletal symptoms among teachers, ergonomic intervention is very important. Intervention should aim to prevent not only the physical perspective but also psychological and environmental perspectives. Further research should be done to find out the risk level and psychological perspectives to developing musculoskeletal symptoms. A future large scale investigation of the incidence of musculoskeletal symptoms among teachers is warranted & may investigate. In this study, a huge number of people are affected by musculoskeletal symptoms. Therefore, it is necessary to prevent or improve the management of work related musculoskeletal symptoms teachers.

Musculoskeletal symptoms become cause of absenteeism, activity limitation and sick leave. If individual become sick, it will be hamper on their performance and production. As a result, individual can't perform work in a normal manner.

So it is important for an occupational therapist to explore their role in these areas & run different prevention programs efficiently & effectively by small ergonomic changes, modifications and education. The government can play a vital role to decrease the rate of incidence, prevention & treatment.

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সম্মতিপত্র

আসসালামু আলাইকুম/ নমস্কার

আমি রুবাইয়া আক্তার রুমু, ৪র্থ পেশাগত বাংলাদেশ হেলথ প্রফেশন ইন্সটিটিউট (বিএইচপিআই), ঢাকা বিশ্ববিদ্যালয়ের মেডিসিন অনুষদের একজন ছাত্রী। আমার ব্যাচেলর ডিগ্রী প্রাপ্তির জন্য আমার একটি গবেষণা পরিকল্পনা, পরিচালনা করা এবং এটা আমার পড়া-শোনার একটি অংশ। আমার গবেষণা প্রকল্পটি হচ্ছে “সাভারের স্কুল শিক্ষকদের পেশি ও অস্থি সম্বন্ধীয় সমস্যার হার নির্ধারণ এবং আনুষঙ্গিক ঝুঁকি খুঁজে বের করা নিয়ে একটি গবেষণা প্রকল্প”। আমার গবেষণা প্রকল্পটি পূরণে আমার কিছু তথ্য সংগ্রহ করা প্রয়োজন সুতরাং এই গবেষণার জন্য অংশগ্রহণকারীর সম্মতি প্রয়োজন এবং তথ্য সংগ্রহের জন্য গবেষক অংশগ্রহণকারীর কাছে থেকে ২০-৩০ মিনিট সময় নিবেন আমি আপনাকে অবহিত করছি যে, এটি একটি একাডেমিক গবেষণা এবং অন্য কোনও উদ্দেশ্যে ব্যবহার করা হবে না। আমি আশ্বস্ত করতে চাই যে, সব তথ্য গোপন রাখা হবে। অংশগ্রহণকারী যে কোন মুহূর্তে সম্মতি প্রত্যাহার করতে পারেন। এছাড়াও আপনি যেটি পছন্দ করেন না সেটি উত্তর না দেয়ার অধিকার আছে। আপনার গবেষণা সম্পর্কে যদি কোন জিজ্ঞাসা থাকে তবে আপনি অনুগ্রহপূর্বক যোগাযোগ করতে পারবেন। গবেষক রুবাইয়া আক্তার রুমু অথবা হাবিবুর রহমান, সহযোগী অধ্যাপক বিএইচপিআই, সিআরপি, সাভার, ঢাকা।

শুরু করার আগে আপনার কি কোন প্রশ্ন আছে?

সুতরাং আমরা ইন্টারভিউ এর দিকে এগিয়ে যেতে পারি।

হ্যাঁ

না

অংশগ্রহণকারীর স্বাক্ষর ও তারিখ

গবেষকের স্বাক্ষর ও তারিখ

স্বাক্ষরী স্বাক্ষর ও তারিখ.....

Consent Form

Assalamualaikum,

I am Rubaiya Akter Jhumu, final Year of B.Sc. in Physiotherapy student of Bangladesh Health Professions Institute (BHPI) affiliated to the Faculty of Medicine, University of Dhaka .To obtain my Bachelor degree, I have to conduct a research project and it is a part of my study. My research title is “**Work related Musculoskeletal Disorders and its associated factors among the School teachers at Savar.**” The aim of this study is to find out the prevalence of neck pain among the students of Bangladesh Health Professions Institute (BHPI).You are requested to participate in this study .The participation would be voluntary. You have the right to withdraw your consent and discontinue participation at any time. You might be benefited or not, but in future you may be benefited and would not be harmful. I am requesting you to give accurate information and assuring you to maintain the confidentiality. This study is academic purpose, which may help to develop the profession. If you have any query about the study as a participant, you may contact with me or my supervisor, Mohammad Habibur Rahman Associate professor Physiotherapy Department of BHPI, CPR, Savar, Dhaka.

I (participant) have read and understand the contents of the form. I agree to participate in the research without any force.

So, I can proceed with the interview.

Yes No

Signature of the participant:

Date:

Signature of the investigator:

Date:

Signature of the witness:

Date:

প্রশ্নপত্র

সাভারের স্কুল শিক্ষকদের পেশি ও অস্থি সম্বন্ধীয় সমস্যার হার নির্ধারণ এবং আনুষঙ্গিক ঝুঁকি খুঁজে বের করা নিয়ে একটি গবেষণা প্রকল্প।

এ প্রশ্নপত্রটি আপনার স্বাস্থ্য এবং কাজ সম্পর্কিত।

বেশির ভাগ প্রশ্নের উত্তর টিক (✓) চিহ্ন দ্বারা পূরণ করতে হবে। আপনার দেয়া উত্তরে যদি আপনার সন্দেহ থাকে তবে চেষ্টা করবেন বাস্তবতার সাথে মিল রেখে সম্ভাব্য সঠিক উত্তর নির্বাচন করতে। আপনার উত্তর যথাযথভাবে নিরাপদে রাখা হবে।

সহযোগিতার জন্য আপনাকে ধন্যবাদ।

অংশগ্রহণকারীর নামঃ

কোড নম্বরঃ

ঠিকানাঃ

তথ্য সংগ্রহের তারিখঃ

অংশ-১

জনসংখ্যা ভিত্তিক তথ্য

১. বয়স বছর।

২. অংশগ্রহণকারীর লিঙ্গ।

পুরুষ

মহিলা

৩. আপনার সর্বোচ্চ শিক্ষাগত যোগ্যতা কি?

.....

৪. স্কুলের ধরণ-

সরকারী বেসরকারী

৫. বৈবাহিক অবস্থা-

অবিবাহিত বিবাহিত বিবাহ বিচ্ছেদ
বিধবা

৬. কত বছর যাবৎ আপনি আপনার বর্তমান কাজটি
করছেন?.....বছর।

অংশ-২

চিকিৎসা বিদ্যা বিষয়ক তথ্য

৭. অংশগ্রহণকারীর উচ্চতা সে.মি.।

৮. অংশগ্রহণকারীর ওজন.....কেজি।

৯. অংশগ্রহণকারীর ওজন..... কেজি/মি.।

১০. সর্বোপরি আপনার স্বাস্থ্যের অবস্থা কি?

ভাল এত খারাপ না খারাপ

১১. নিম্নলিখিত কোন একটি রোগ দ্বারা কি আপনি আক্রান্ত?

উচ্চ রক্তচাপ ডায়াবেটিস মেলাইটাস জানি না।

১২. সারাদিনের কাজ শেষে আপনি শারীরিকভাবে কতটুকু ক্লান্ত হন-

ক্লান্ত না সামান্য ক্লান্ত খুব ক্লান্ত

অংশ-৩

পেশি ও অস্থি জনিত ব্যাধির শরীরের তথ্য

১৩. আপনার কাজে নিম্নে উল্লেখিত শরীরের কোন অংশ সমূহে আপনি সমস্যা/ অস্বস্তি বোধ করেছেন।

| | | |
|------------------------|--------------------------------|-----------------------------|
| ঘাড় | <input type="checkbox"/> হ্যাঁ | <input type="checkbox"/> না |
| পিঠের ওপরের অংশ | <input type="checkbox"/> হ্যাঁ | <input type="checkbox"/> না |
| পিঠের নিচের অংশ | <input type="checkbox"/> হ্যাঁ | <input type="checkbox"/> না |
| কাঁধ | <input type="checkbox"/> হ্যাঁ | <input type="checkbox"/> না |
| কনুই | <input type="checkbox"/> হ্যাঁ | <input type="checkbox"/> না |
| কজি/হাত | <input type="checkbox"/> হ্যাঁ | <input type="checkbox"/> না |
| নিতম্বের সংযোগ বা উরু | <input type="checkbox"/> হ্যাঁ | <input type="checkbox"/> না |
| গোড়ালি বা পায়ের পাতা | <input type="checkbox"/> হ্যাঁ | <input type="checkbox"/> না |

১৪. আপনি কোন ধরনের পেশি ও অস্থি জনিত অস্বস্তি অনুভব করেন?

ব্যথ্যা ঝিঝি ভাব অবশ ভাব

অন্যান্য

অংশ-৪

পরিবেশগত সমস্যা

১৫. প্রায় সারাদিন কি আপনি একই ধরনের কাজ করেন?

- হ্যাঁ না [উত্তর “না” হলে ১৬ নং প্রশ্ন এড়িয়ে যান]

১৬. আপনি কি মনে করেন সারাদিন একই ধরনের কাজ আপনার পেশি ও অস্থি জনিত সমস্যার জন্য দায়ী?

- হ্যাঁ না

১৭. আপনাকে কোন ধরনের কাজ বেশি করতে হয়?

- দাঁড়িয়ে থাকা।
 বসে থাকা।
 বাহু বা হাত প্রসারিত করা।
 অনেকক্ষণ একই অবস্থায় কাজ করতে হয়।
 প্রতি মিনিটে বার বার একই কাজ করতে হয়।
 বোর্ডে লেখার জন্য হাত প্রসারিত করতে হয়।

১৮. আপনি কি মনে করেন অনেকক্ষণ দাঁড়িয়ে থাকা/বসে থাকা/একই অবস্থায় কাজ করা/প্রতি মিনিটে বার বার একই কাজ করা/ বোর্ডে লেখার জন্য হাত প্রসারিত করা আপনার পেশি ও অস্থি জনিত সমস্যার জন্য দায়ী?

- হ্যাঁ না

১৯. আপনি কোন পদ্ধতিতে শ্রেণীকক্ষে শিক্ষকতা করেন?

- হ্যাঁ না

২০. শিক্ষকতার সময় আপনি কি ধরনের সরঞ্জাম ব্যবহার করেন?

- চক মার্কার অন্যান্য [“অন্যান্য” উত্তর হলে ২১ নং প্রশ্ন

এড়িয়ে যান]

২১. আপনি কি মনে করেন এই সরঞ্জামগুলো ব্যবহার করা আপনার পেশি ও অস্থি জনিত সমস্যার কারণ?

- হ্যাঁ না

২২. আপনি কি স্কুলে সিঁড়ি ব্যবহার করেন?

- হ্যাঁ না [উত্তর ‘না’ হলে ২৩ নং প্রশ্ন এড়িয়ে যান]

২৩. আপনি কি মনে করেন সিঁড়ি ব্যবহার করা আপনার পেশি ও অস্থি জনিত সমস্যার জন্য দায়ী?

- হ্যাঁ না

অংশ-৫

মনস্তাত্ত্বিক উপাদান

২৪. আপনি কি আপনার বর্তমান কাজ নিয়ে সন্তুষ্ট?

- হ্যাঁ না [উত্তর “হ্যাঁ” হলে ২৫ নং প্রশ্ন এড়িয়ে যান]

২৫. আপনি কি আপনার কাজ নিয়ে হতাশ?

- হ্যাঁ না [উত্তর “হ্যাঁ” হলে ২৬ নং প্রশ্ন এড়িয়ে যান]

২৬. আপনি কি মনে করেন হতাশা আপনার পেশি ও অস্থি জনিত সমস্যার কারণ?

- হ্যাঁ না

২৭. দিনে কাজের শেষে আপনি কি মানসিকভাবে ক্লান্ত বোধ করেন?

হ্যাঁ না [উত্তর “হ্যাঁ” হলে ২৮ নং প্রশ্ন এড়িয়ে যান]

২৮. আপনি কি মনে করেন মানসিক ক্লান্তি আপনার পেশি ও অস্থি জনিত সমস্যার জন্য দায়ী?

হ্যাঁ না

২৯. আপনি কি মনে করেন আপনার বিরতির সময় আপনার জন্য যথেষ্ট?

হ্যাঁ না [উত্তর “হ্যাঁ” হলে ৩০ নং প্রশ্ন এড়িয়ে যান]

৩০. আপনি কি মনে করেন বিরতির সময় অপরিপূর্ণতা আপনার পেশি ও অস্থি জনিত সমস্যার কারণ?

হ্যাঁ না

Questionnaire

A research project on prevalence of Musculoskeletal Disorder and its associated factors among the School Teachers at Savar

This questionnaire addresses your work and your health.

Most questions can simply answered by tick mark. In case you doubt about the answer to be given, try to choose the possibility that nears best reality. Your answer will be treated in the strictest confidence.

Thank you very much for your cooperation!

Name:

Code no:

Address:
collection:

Date of data

Part 1

Socio-demographic information

1. Age - years

2. Gender of the participants-

Male

Female

3. What is the highest education that you completed successfully?

.....

4. Type of school?

Government Non-government

5. Marital status-

Single Married Divorce Dow

**6. How many years have you been carrying out your present work-
.....years**

Part 2

Medical information

7. Hight of the participant- cm

8. Weight of the participant- kg

9. BMI of the participant- kg/m²

10. What is your health status in general?

- Good Not too bad Poor

11. Are you suffering from any of the following diseases?

- Hypertension Diabetes mellitus Don't know

12. How tired are you normally at the end of a working day physically?

- Not tired A bit tired Very tired

Part 3

Body area of musculoskeletal disorder

13. Have you ever had trouble in your work from followings chart disorders:

| | | |
|-------------|------------------------------|-----------------------------|
| Neck | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Upper back | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Lower back | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Shoulder | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Elbows | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Wrist/Hands | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Hips/Thighs | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Knees | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Ankles/Feet | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

14. What type of musculoskeletal discomfort do you experienced?

- Pain Parasthesia Tingling sensation
- Others

Part 4

Environmental factor

15. Do you carry out the same work almost the whole day?

Yes
'No']

No

[skip Qs 16 if the answer is

16. Do you think your musculoskeletal discomfort is responsible for carrying out the same work?

Yes

No

17. Which kind of work do you have in your work?

Standing

Sitting

Extension of arms/ hand-

Working in the same position for long periods

Doing repetitive tasks many times

Stretching to write on board

18. Do you think Standing/Sitting/Extension of arms or hand/Working in the same position for long periods /Doing repetitive tasks many times /Stretching to write on board is responsible for your musculoskeletal discomfort?

Yes

No

19. Which way you teach the students in classroom-

- In Blackboard In whiteboard In Multimedia

20. Which kind of materials you use during teaching-

- Chalk Marker Others

21. Do you think your pain is responsible for using this materials-

- Yes No

22. Do you use stairs in school-

- Yes No [Skip Qs 23 if the answer is 'No']

23. Do you think your pain is responsible for using stairs in school-

- Yes No

Part 5

Psychological Factor

24. Are you satisfied with your current job-

- Yes No [skip Qs 25 & 26 if the answer is 'Yes']

25. Are you depressed with your profession-

Yes

No

[Skip Qs 26 if the answer is 'No']

26. Do you think your depression is one of the causes of your musculoskeletal pain-

Yes

No

27. Do you feel mental tiredness at the end of the workday-

Yes

No

[Skip Qs 28 if the answer is 'No']

28. Do you think your musculoskeletal discomfort is result for your mental tiredness-

Yes

No

29. Do you think your break time is sufficient for you-

Yes

No

[Skip Qs 30 if the answer is 'Yes']

30. Do you think your insufficient break is one of the cause for your musculoskeletal discomfort-

Yes

No

Permission letters

Permission Letter

31 August, 2016

To

The Head of the physiotherapy department,
Bangladesh Health Professions Institute (BHPI)
CRP-Chapain, Savar, Dhaka-1343.

Subject-Seeking permission for data collection to conduct research project.

Sir,

With due respect and humble submission to state that I am Rubaiya Akter Jhumu, student of 4th year B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). As a part of my academic curriculum I have to do a research project. The Ethical Committee "Institutional Review Board (IRB)" has approved my research title on "Work Related Musculoskeletal Disorders and it's Associated Factors among the School Teachers at Savar" under the supervision of Mohammad Habibur Rahman Assistant Professor, Department Of Physiotherapy, (BHPI). I have to collect data from School teachers of several School at Savar. I would like to assure that my study will not be harmful for the participants.

I, therefore, pray and hope that you would be kind enough to grant my application and give me the permission and oblige thereby.

Yours obediently,

Rubaiya Akter Jhumu

4th year, Session: 2011-2012

Physiotherapy Department, BHPI, CRP-Chapain
Savar, Dhaka- 1343.

Forwarded
Habib 31.8.2016

Allowed
9/10
31.08.16

Md. Obaidul Haque
Associate Professor & Head of the Department
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343



বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
BANGLADESH HEALTH PROFESSIONS INSTITUTE (BHPI)
(The Academic Institute of CRP)

CRP-Chapain, Savar, Dhaka, Tel: 7745464-5, 7741404, Fax: 7745069
BHPI-Mirpur Campus, Plot-A/5, Block-A, Section-14, Mirpur, Dhaka-1206. Tel: 8020178,8053662-3, Fax: 8053661

তারিখ : ২৫.১০.২০১৬

প্রতি
অধ্যক্ষ
সাভার ল্যাবরেটরি স্কুল
সাভার, ঢাকা।

বিষয় : রিসার্চ প্রজেক্ট এর জন্য আপনার প্রতিষ্ঠান সফর ও তথ্য সংগ্রহ প্রসঙ্গে।

জনাব,

আপনার সদয় অবগতির জন্য জানাচ্ছি যে, পক্ষাঘাতগ্রস্তদের পুনর্বাসন কেন্দ্রে-সিআরপি'র শিক্ষা প্রতিষ্ঠান বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই) ঢাকা বিশ্ববিদ্যালয় অনুমোদিত বিএসসি ইন ফিজিওথেরাপি কোর্স পরিচালনা করে আসছে।

উক্ত কোর্সের ছাত্রছাত্রীদের কোর্স কারিকুলামের অংশ হিসাবে বিভিন্ন বিষয়ের উপর রিসার্চ ও কোর্সওয়ার্ক করা বাধ্যতামূলক।

বিএইচপিআই'র ৪র্থ বর্ষ বিএসসি ইন ফিজিওথেরাপি কোর্সের ছাত্রী রাবেয়া আক্তার ঝুমু তার রিসার্চ সংক্রান্ত কাজের তথ্য সংগ্রহের জন্য আগামী ২৬.১০.২০১৬ থেকে ৩১.১০.২০১৬ তারিখ পর্যন্ত আপনার প্রতিষ্ঠানে সফর করতে আগ্রহী। তার রিসার্চ শিরোনামঃ

Work Related Musculoskeletal disorder and it's associated factor's among the school teacher's at Savar, Dhaka.

তাই তাকে আপনার প্রতিষ্ঠান সফর এবং প্রয়োজনীয় তথ্য প্রদান সহ সার্বিক সহযোগীতা প্রদানের জন্য অনুরোধ করছি।

ধন্যবাদান্তে

মোঃ ওবায়দুল হক
অধ্যক্ষ-ভারপ্রাপ্ত
বিএইচপিআই।



বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
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তারিখ : ২৫.১০.২০১৬

প্রতি
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সাভার মডেল একাডেমি
সাভার, ঢাকা।

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ধন্যবাদান্তে

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অধ্যক্ষ-ভারপ্রাপ্ত
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তারিখ : ৩১.০৮.২০১৬

প্রতি
প্রধান শিক্ষক
সাভার এসেড স্কুল
ব্যাংক কলোনী, সাভার, ঢাকা।

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ধন্যবাদান্তে

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বিএইচপিআই।

