PREVALENCE OF OBESITY AMONG THE MUSCULOSKELETAL PATIENT'S ATTENDING AT THE MUSCULOSKELETAL DEPARTMENT OF CRP

Md. Salahuddin

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BHPI, CRP, Savar, Dhaka.

Bangladesh Health Professions Institute (BHPI)

Department of Physiotherapy

CRP, Savar, Dhaka-1343

Bangladesh

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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

PREVALENC OF OBESITY AMONG MUSCULOSKELETAL PATIENT'S ATTENDING AT THE MUSCULOSKELETAL DEPARTMENT OF THE CRP

Submitted by Md. Salahuddin, for the partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B.Sc.PT).

…………………………..
Muhammad. Millat Hossain
B.Sc.PT (Hons.),
Lecturer,
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka
Supervisor

………………………….
Mohammad Anwar Hossain
B.Sc.PT (Hons.), Dip. Ortho. Med., MPH
Associate professor
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

……………………………
Nasirul Islam
B.Sc.PT (Hons.), MPH
Assistant professor
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

……………………..	…………………………
Md. Shofiqul Islam	**Md. Obaidul Haque**
B.Sc.PT (Hons.), MPH	B.Sc. PT (Hons.), Dip. Ortho.Med.,MPH
Lecturer	Associate Professor & Course Coordinator
Department of Physiotherapy	Deprtment of Physiotherapy
BHPI, CRP, Savar, Dhaka	BHPI, CRP, Savar, Dhaka

Declaration

I declare that the work presented here is my own. All source used have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation or dissemination of the study. I would be bound to take written consent from my supervisor.

Signature: **Date:**

Md. Salahuddin

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BHPI, CRP, Savar, Dhaka-1343

Acknowledgement

Abbreviations

&	And
BMI	Body mass index
BHPI	Bangladesh Health Profession's Institute
CRP	Center for the Rehabilitation of the Paralyzed
CTS	Carpal Tunnel Syndrome
DJD	Degenerative joint disease
IASP	International Association for the Study of Pain
LBP	Low back pain
MSDs	Musculoskeletal Disorders
NIPORT	National Institute of Population Research and Training
OA	Osteoarthritis
SPSS	Statistical Package for Social Sciences
US	United States
WHO	World Health Organization

CONTENTS

List of Tables

Page No.

List of Figures

Abstract

The purpose of the study was to identify the prevalence of obesity among the musculoskeletal patient's attending at the musculoskeletal department of CRP. *Objectives*: To find out the socio-demographic information among the patient's attending at musculoskeletal department of CRP, to establish the prevalence of obesity by age and sex, todetermine the main musculoskeletal disorder among the obese participants, to sort out other musculoskeletal disorder except for the main musculoskeletal disorder among the obese and to explore the distribution of hypertensionand diabetes among the obeseparticipants.*Methodology:* A cross sectional survey study was conducted to collect data from 162 participants, age ranging from 18-75 years. Data were numerically coded and captured in Microsoft Excel, using an SPSS 16.0 version software program. *Result:* Prevalence of obesity was 12.30%, with 55% were $\geq$ 50 years old and 45% were < 50 years old, 60% of whom were females and 40% were males. 20 were obese who complained at least one musculoskeletal problem. Among them osteoarthritis of the knee (10, 50%) was the most common musculoskeletal disorder followed by low back pain (7, 35%), ankle sprain, neck pain and calcaneal spur (1, 5%). Half of the obese (10, 50%) participants suffered from more than one musculoskeletal problems. Among the musculoskeletal problems,low back pain (3, 15%) was the most common followed by OA of the knee, ankle sprain and neck pain (2, 10%) and frozen shoulder (1, 5%). Most of the obese sheared that they had no hypertension (13, 65%) and diabetes (17, 85%) where rest of the patients suffered with hypertension (7, 35%) and diabetes (3, 15%). *Conclusion:* Prevalence of obesity is rapidly increasing day by day in the world. Now-a-days obesity is the issue of burning question. It is essential to identify the actual prevalence of obesity among musculoskeletal patients by taking mass population in all over the Bangladesh.

Key word:Prevalence, Obesity, Musculoskeletal disorder.

| CHAPTER-I | INTRODUCTION |

1.1 Background

Obesity prevalence is increasing rapidly, and obesity is becoming a problem even in urban areas of developing countries (Seidell, 2000).World Health Organization (2010) estimated global prevalence of obesity 400 million in 2005 and predicted that it would be more than 700 millions in 2015.In South Asian countries the obesity prevalence has increased more in urban areas due to change in life style. In Bangladesh according to demographic and health survey Bangladesh 2004, the prevalence of obesity (BMI $\geq$ 25) in women was 9% and women living in urban areas were found more than three times obese than rural area women (NIPORT, 2004). In India, National Family Health Survey 2005-2006 (NFHS-3) shows 12.1% men and women are overweight /obese and the more prevalence in urban areas (WHO, 2010). In Pakistan obesity is increasing and has become a public health challenge. A study based on National Health Survey of Pakistan (1990–1994) the prevalence of overweight and obesity in 15 years and above was 25.0% (BMI $\geq$ 23 kg/m2) and obesity was 10.3% (BMI $\geq$ 27 kg/m2) (Jafar et al, 2006). A study in 14 provinces in China in population of age 35-85 shows the total prevalence of obesity 13.94% (Cheng et al, 2005). In another study the prevalence of obesity (BMI $\geq$ 25 kg/m2) was 29.1% in men and 21.3% in women (Ko & Tang, 2006).

There is an obvious interest in identifying, reducing, and preventing exposures that contribute to the occurrence of musculoskeletal disorders (MSDs). According to a comprehensive review of epidemiologic research conducted by NIOSH (1997), there is compelling evidence of an association between certain work related physical factors and MSDs when the, levels of exposure are high. The physical factors include posture, vibration, repetition, and force. The study also found evidence to support the influence of individual risk factors on the occurrence of MSDs. These individual risk factors include elevated body mass index (BMI). Potential risk factors identified in studies for MSDs, in particular lumbar disc hernia ion and CTS, include BMI, weight, height, and obesity (Becker et al, 2002).

A study of a sample of the Australian population found a statistically significant positive relationship between level of obesity and the probability of having a MSD (Kortt & Baldry, 2002). Koleva & Kostova (2003) reported that the development of MSDs is 2.38 times more frequent in overweight individuals than in individuals not considered to be overweight. In a study of men and women with newly diagnosed CTS, the risk of CTS increased 8% with a weight gain of approximately six pounds (Karpitskaya, 2002). Similar findings supporting the significant positive relationship between BMI and CTS have been published (Kouyoumdjian, 2002).

A recent study identified low back pain and back disorders (not specified as low back) as two of the top ten most costly physical conditions affecting six large U.S. employers. Low back pain was ranked fourth and back disorders (not specified as low back) ranked seventh. Among the top twenty most costly physical conditions, six of the conditions were identified as MSDs (Goetzel, 2003).

On the other hand, cross-sectional data show a strong association between nutritional habits and physical inactivity and overweight and obesity, which could explain the increasing rates in some countries (Prentice & Jebb, 1995). Furthermore, prospective studies provide additional evidence to suggest that a population increase in physical activity may help to prevent the growing prevalence of overweight and obesity over time (Rippe & Hess, 1998).

1.2 Rationale

Prevalence of obesity among musculoskeletal patients has not been studied before in Bangladesh. This study was formulated to fill up the gap of knowledge in this area. Obesity poses serious health problems both in developed and developing countries. The prevention and control of obesity in developing countries deserve urgent attention since the disease is expected to double in these countries in the next 20 to 25 years. The problems of obesity in Bangladesh is also increasing day by day as like as the whole world. They are mostly suffers with many types of musculoskeletal disease like as low back pain, neck pain, osteoarthritis, shoulder capsulitis, ankle sprain, quadriceps weakness, carpal tunnel syndrome etc. But they are not aware about these problems. The aim of the study was to identify the prevalence of obesity among the musculoskeletal patients attending at the musculoskeletal department of CRP. After completing this study the obese patients will be benefited because after that they will aware about Physiotherapy treatment for musculoskeletal problem. They will also know that they can get help from Physiotherapy. This study will be helpful for CRP authority as well as national policy makers to make various sorts of Physiotherapy treatment strategies for obese patients with musculoskeletal disorders separately. This study also will be helpful for the students to do further research as the foundation of study on this area. This study also will be helpful in making Physiotherapist to aware about the musculoskeletal problem of obese patients more specifically. It will assist to make current Physiotherapy practice more holistic and effective for the obese patients with musculoskeletal problem in Bangladesh. Physiotherapy plays a vital role in the management of obese patient with musculoskeletal problem. So it will also be helpful for physiotherapist in working in this area for delivering treatment service. This study will also be helpful for different organizations working in this area for including Physiotherapy service in their program for delivering a comprehensive treatment service. Thus the study might create a future prospect of Physiotherapy profession in Bangladesh.

1.3 Research Question

What is the prevalence of obesity among the musculoskeletal patient's attending at the musculoskeletal department of CRP?

1. 4 Objectives

1.4. 1 General objective

To identify the prevalence of obesity among musculoskeletal patient's attending at the musculoskeletal department of CRP.

1.4. 2 Specific objectives

- To find out the socio-demographic information among the patient's attending at musculoskeletal department of CRP.
- To establish the prevalence of obesity by age and sex.
- To determine the main musculoskeletal disorder among obese.
- To sort out other musculoskeletal disorder except for the main musculoskeletal disorders among the obese.
- To explore the distribution of hypertension and diabetes among the obese.

1.5 List of Variables

- Age
- Sex
- Weight
- Height
- Obesity

1.6 Operational definitions

Obesity

Body mass index (BMI) greater than or equal to 30 is obesity.

Overweight

Body mass index (BMI) greater than or equal to 25 is overweight.

Musculoskeletal disorder

Musculoskeletal disorders (MSDs) are the disorders of muscles, tendons, ligaments and nerves that develop due to work related factors such as repetitive work or activities and physical factors such as obesity. Some examples of musculoskeletal disorders include back pain, neck pain, carpal tunnel syndrome, osteoarthritis, tendonitis and tenosynovitis, etc.

Obesity has been defined as 'a physiological condition in which excess body fat has accumulated to an extent that can negatively affect health' (Bruce-Keller et al, 2009). The measure used most commonly to describe the level of fatness in populations is the body mass index (BMI). BMI is a weight-for-height measure, introduced as the Quetelet Index in the 1830s and widely used for the past several decades to estimate population trends in fatness (Keys et al, 1972). BMI is calculated as weight (kg)/height (m) 2. The BMI measurement is popular for epidemiological studies because of its simplicity and because it provides a fairly reliable indicator of the prevalence of obesity in populations (less so for obesity in individuals). However, there are limitations to its use, even in population studies. The relationship between BMI and obesity varies with body composition, height and some other factors (Weinsier et al, 1998). For example, BMI does not distinguish between weight associated with lean tissue, such as muscle and bone, and weight associated with fat. Athletes and sports participants commonly have larger muscle mass than other people with the same height and weight, and muscle mass influences BMI values (Bjorntrop, 1998).

Obesity can be measured more reliably in other ways, such as skin fold measurements, underwater weighing, bioelectrical impedance, and dual energy X-ray absorptiometry. However, these methods also have limitations related to difficulty of use in large populations and accuracy in specific populations. There have been efforts to use BMI cut-offs to categories people in terms of their risk for Type 2 diabetes and cardiovascular diseases. This has led to the establishment of internationally recognized categories to monitor population trends in body size. A BMI value in the range of < 18.5 kg/m2 is defined as underweight, a BMI of 18.5-24.9 kg/m2 is normal weight, 25-29.9 kg/m2 is overweight, 30-34.9 kg/m2 is obese class 1, 35-39.9 kg/m2 is obese class 2 and 40 or >40 kg/m2 is obese class 3 or morbidly obese (WHO, 2004). The BMI range between normal and obese is defined as 'overweight'. The WHO categories have been adopted as the national standard in Australia (National Health Data Committee, 2003). The proportions of the population within these categories are monitored routinely and reported in national health publications.

Associations between BMI, percentage of body fat and body fat distribution have been shown to differ between ethnic groups and across age categories. For example, some Asian populations have shown elevation of health risks at lower BMI points than Caucasians and current international guidelines recommend using a lower cut-off of 26 kg/m2 as the threshold for obesity in Asian populations (Grundy, 1998).

Obesity is also associated with other physiopathological conditions with high economic cost and health relevance (Aronne, 1998). Furthermore, the rapid increase in obesity rates over recent years suggests that cultural and societal influences, in addition to other physiopathological or genetic determinants, are affecting the adjustment in the energy balance equation (Rosenbaum et al, 1997). Thus, it is estimated that 40–70% of the variation in obesity-related phenotypes is heritable (Comuzzie & Allison, 1998) while environmental influences may explain about 30 % of the obesity cases (Hill, 1998). The great increase in the prevalence of obesity in populations whose gene pool has been relatively constant provides confirmation that environmental factors have considerable importance (Willett, 1998; Bray & Popkin, 1998). The process of modernization and economic restructuring in both developing and developed countries has brought about a number of consequences affecting nutritional and physical activity patterns that contribute to the increasing rates of obesity (World Health Organization, 1998). The food system has improved the availability of high-yielding energy foods, while the sedentary lifestyle with motorized transport and many labour-saving devices, as well as other physically-inactive pursuits (TV viewing, computer work etc.), have risen in recent decades (Williamson, 1996).

In the developed world, musculoskeletal disorders (MSDs) such as arthritis and rheumatism represent a substantial burden to patients and the health care system. Individuals with MSDs experience pain, restricted physical movement, and an overall reduction in quality of life (Coyte et al, 1998). There is evidence to suggest that MSDs are associated with a number of risk factors including age, body mass index (BMI), education attainment, income level, and race (Yelin, 1997). In this study, the relationship between MSDs and the level of obesity (BMI) is of particular interest. This is because a number of studies have reported that obesity is related to a variety of musculoskeletal disorders ranging from osteoarthritis (in both the knee and hip) to

joint pain (Bray, 1985). For example, the greater prevalence of osteoarthritis with increasing body weight has been reported in several cross-sectional studies (Goldin et al, 1976). It has been reported that a 6-10 kg weight loss in morbidly obese subjects is associated with a relief from pain in the lower back, ankles, and feet (McGoey et al, 1990).

Low back pain is a common musculoskeletal symptom that may be either acute or chronic. It may be caused by a variety of diseases and disorders that affect the lumbar spine (Leach et al, 1973). Low back pain is often accompanied by sciatica, which is pain that involves the sciatic nerve and is felt in the lower back, the buttocks, and the backs of the thighs. Low back pain has several different possible causes: strain on the muscles of the lower back may be caused by obesity; pregnancy; or job-related stooping, bending, or other stressful postures (Waddell, 2005).

Obesity is one of several lifestyle factors that have been suspected of not merely relating to, but in fact causing LBP. There are several hypotheses relating to a link between obesity and LBP (Pi-Sunyer, 1993). It has been postulated that excessive body weight could have mechanical ill effects on the back caused by excessive weight bearing (Aro & Leino, 1985). These increased mechanical demands from obesity have been suspected of causing LBP through excessive wear and tear (Felson, 1996). Buckwalter et al (1993) has also been suggested that metabolic disorders may be detrimental; combined with its co-morbidities of diabetes and hypertension may alter the pathophysiology of diseases of the tendons and ligaments during the process of aging thus potentially leading to LBP.

Osteoarthritis (OA), which is also known as osteoarthrosis or degenerative joint disease (DJD), is a progressive disorder of the joints caused by gradual loss of cartilage and resulting in the development of bony spurs and cysts at the margins of the joints. The name osteoarthritis comes from three Greek words meaning bone, joint, and inflammation (Berger, 2001). OA is one of the most common causes of disability due to limitations of joint movement, particularly in people over 50. It is estimated that 2% of the United States population under the age of 45 suffers from osteoarthritis; this figure rises to 30% of persons between 45 and 64, and 63-85% in those over 65. About 90% of the American population will have some features of OA

in their weight-bearing joints by age 40. Men tend to develop OA at earlier ages than women (Pavelka, 2000).

The International Association for the Study of Pain (IASP) in its classification of chronic pain defines cervical spinal pain as pain perceived anywhere in the posterior region of the cervical spine, from the superior nuchal line to the first thoracic spinous process (Bliss et al, 2004). People with a higher body mass index (BMI) may be at risk for developing neck pain. Since more than 44 million American are considered obese by government standards, it is a concern that affects many. The research suggests that obese women and men have an approximately 20 percent increased risk of neck pain than people considered average weight (Petty & Moore, 2004).

An ankle sprain is a partial or complete tear of the ligaments that support the ankle. Ligaments are strong bands of tissue that cross joints and connect bones to each other. Musculoskeletal conditions that required hospitalization, including sprains, strains and dislocations, were also more common among obese individuals (Finkelstein et al, 2007).

Carpal tunnel syndrome is a symptom complex resulting from compression of the median nerve in the carpal tunnel, with pain and burning or tingling paresthesias in the fingers and hand, sometimes extending to the elbow. Pregnancy, obesity, arthritis, certain thyroid conditions, diabetes, and certain pituitary abnormalities all predispose to carpal tunnel syndrome (Seiler & John, 1997).

Muscle contractions have a great deal to do with the forces that are transferred across a joint, and quadriceps muscle weakness is known to be a risk factor for the development of knee osteoarthritis. Because of their sedentary lifestyle, obese people are often thought to have weak muscles. In fact, muscle strength and energy expenditure are normal in obesity when adjusted for fat-free mass and compared with age-matched and sex-matched controls (Pope et al, 1985).

A rotator cuff injury is a tear or inflammation of the rotator cuff tendons in the shoulder. The same adaptive movements obese people use to get out of a chair can also contribute to rotator cuff problems. In a case-control study comparing 311

9

patients who required rotator cuff surgery with the general population, the risk was 25% higher for overweight patients, 80% to 120% higher for moderately obese patients, and 300% higher for patients whose BMI was 35 or above (Part, 2009).

CHAPTER-III	METHODOLOGY

3.1 Study design

The aim of the study was to find out the prevalence of obesity among the musculoskeletal patient's attending at the musculoskeletal department of CRP. For this reason, the investigator chooses a cross sectional survey study because this is the best way to determine prevalence.

3.2 Study site

The study was conducted at musculoskeletal department of CRP, Savar, Dhaka.

3.3 Study population

The patients attending at the musculoskeletal department of CRP was the study population.

3.4 Sample size

One-sixty-two patients were selected as sample from the population for this study. Sometimes the sample size may be is big and sometimes it may be small, depending on the population and the characteristics of the study. Though there was no information about the prevalence of obesity in our country, so the information about the prevalence of obesity was taken from the nearest country of India and estimated

sample size 162 by the following formula- $n = \left\{\frac{Z(1-\frac{\alpha}{2})}{d}\right\}^2 \times pq$

Here,

$Z(1-\frac{\alpha}{2})$ = 1.96

P= 0.12

q= 1-p

d= 0.05

So, the researcher aimed to focus his study by 162 samples following the calculation above.

3.5 Sampling procedure

The study was conducted by using the convenience sampling methods because it is the easiest, cheapest and quicker method of sample selection. It was easy to get those subjects according to the criteria concerned with the study purpose through the convenience sampling procedure.

3.6 Inclusion criteria

- The patients attended at musculoskeletal department of CRP.
- Both male and female patients were selected.
- Age group was between 18-75 years.
- Subject who were willing to participate in the study.

3.7 Exclusion criteria

- Female who were pregnant.
- Subjects who had recent major accident or major surgery in any part of the body.
- Subject who were medically unstable.
- Subject who had mental disorders.

3.8 Data collection

3.8.1 Data collection instrument

A questionnaire with mixed question was used for data collection. In that time some other necessary materials were used like weight machine, height tap, scale, calculator, pen etc. Researcher took permission from each participant by using a written consent form in Bangla and English.

3.8.2 Procedure of data collection

At very beginning researcher clarified that the participant had the right to refuse to answer of any question during completing questionnaire. They could withdraw from the study at any time. Researcher also clarified to all participants about the aim of the study. Participants were ensured that any personal information would not be published anywhere. Researcher took permission from each participant by using a written consent form. After getting consent from the participants, a

questionnaire was used to identify the prevalence of obesity among musculoskeletal patients. Height was measured in standing position, with shoes removed, using a wall-mounted height tap. Weight was measured with the subject in light indoor clothes, with shoes removed and emptied pockets. BMI (body mass index) was calculated as weight in kilograms divided by height in meters squared, and subjects were stratified into obese (BMI $\geq 30 \, \mathrm{kg/m2}$) , overweight (BMI 25-29.9 kg/m2) normal (BMI 18-24.9 kg/m2). Stimuli that can destruct interviewee were removed to ensure adequate attention during interview. Face to face interview is the most effective way to get full cooperation of the participant in the survey. According to the understanding level of the participant, sometimes the questions were described in the native language, so that the participants can understand the questions perfectly and answer accurately. All data were collected by the researcher himself.

3.9 Data analysis

Data was analyzed with the software named Statistical Package for Social Sciences (SPSS) Version 16.0. Data were numerically coded and captured in Microsoft Excel, using an SPSS 16.0 version software program. Microsoft Office Excel 2007 was used to decorate the bar graph charts.

3.10 Ethical consideration

A research proposal was submitted to ethical review committee of Bangladesh Health Profession's Institute (BHPI) for being approval. At first the researcher was apply for official permission for the study from the head of the Physiotherapy Department of CRP. Then the head of the Physiotherapy Department of CRP permitted to collect data at musculoskeletal department of CRP, Savar. The ethical consideration was obtained through an informed consent letter to the participant. Consent was obtained by providing each participant a clear description of the study purpose, the procedure involves in the study and also informing them that if they wish they can withdraw themselves any time from the study. Participant were explained about their role in the study and it was explained that there is no direct benefit from the study but in future, cases like them may will be benefited from it. Participants were also advised that they are free to decline answering any questions

during interview. The necessary information had been kept secure place to also ensure confidentiality. They were also assured that it would not cause any harm. Then they signed the consent form.

3.11 Rigor

This study was conducted in systematic way. All the steps of research were followed by the researcher sequentially. During data collection the researcher avoided influencing the whole process by own perspectives, values and biases. The researcher never influenced the participants by his own perceptions during data collection. A trustful relationship with participants was always maintained and the documents were kept confidential. Biasness had been avoided during data analysis and data was analyzed by the scientific way of SPSS.

3.12 Limitation

It was an undergraduate study so there may had some limitations and barriers during on conduction of this study. The study was conducted at musculoskeletal department of CRP. It was impossible for the researcher to include huge number of patients as sample because many patients took Physiotherapy treatment at the same time in a same day. So some of the patient did not get chance as a sample during the time of data collection.

Altogether, 162 respondents participated in the study, giving a response rate of 98.8%. 162 data was included where male (98, 60%) and female (64, 40%) aged <50 years (125, 77%) and ≥50 years (37, 23%) with a mean age of 40.48 (SD ±13.67) year. The mean body mass index was 25.57 (SD±4.14). Of the respondents, 48.2% were normal, 39.5% overweight and 12.3% were obese. The socio-demographic information of the participants was presented in Table-1.

4.1 Socio-demographic information of the participants

Variables	Participants	
	Frequency	%
Obesity		
Normal	78	48.2
Overweight	64	39.5
Obese	20	12.3
Age		
<50 years	125	77
≥50 years	37	23
Sex		
Male	98	60
Female	64	40

Table-1: Socio-demographic information of the participants.

4.2 Prevalence of obesity by age and sex

Prevalence of obesity was 12.3%, with 55% were ≥ 50 years old and 45% were < 50 years old, 60% of whom were females and 40% were males. Prevalence of obesity by age and sex was presented on Table-2.

Variable	Obesity	
	Frequency	%
Age		
<50 years	9	45
≥50 years	11	55
Sex		
Male	8	40
Female	12	60

Table-2: Prevalence of obesity by age and sex.

4.3 Distribution of the main musculoskeletal disorder among the obese

Among the 162 musculoskeletal patients, 20 were obese who complained at least one musculoskeletal problem. Among them osteoarthritis of the knee (10, 50%) was the most common musculoskeletal disorder followed by low back pain (7, 35%), ankle sprain, neck pain and calcaneal spur (1, 5%).
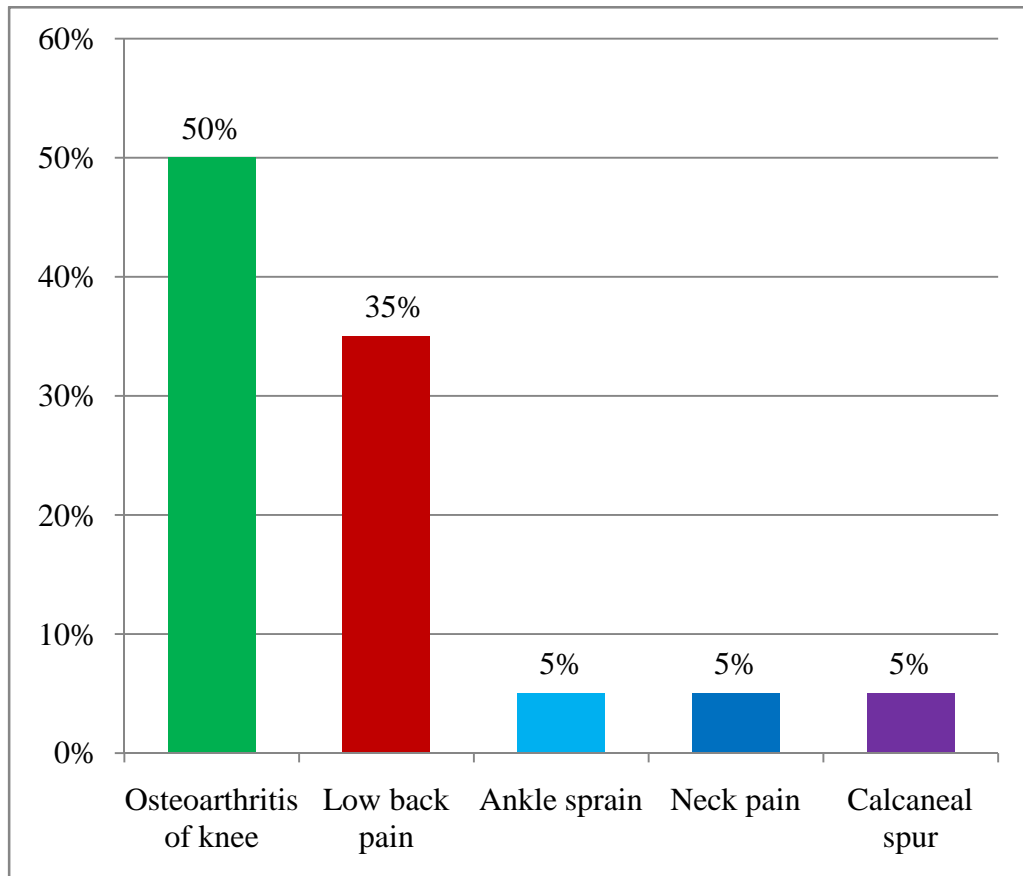
Figure-1: Distribution of the main musculoskeletal disorders of the obese.

4.4 Distribution of the other musculoskeletal disorder except for the main musculoskeletal disorder among the obese

Among 20 obese musculoskeletal participants, half of the obese (10, 50%) participants suffered from more than one musculoskeletal problems. Among the musculoskeletal problems, low back pain (3, 15%) was the most common followed by OA of the knee, ankle sprain and neck pain (2, 10%) and frozen shoulder (1, 5%).
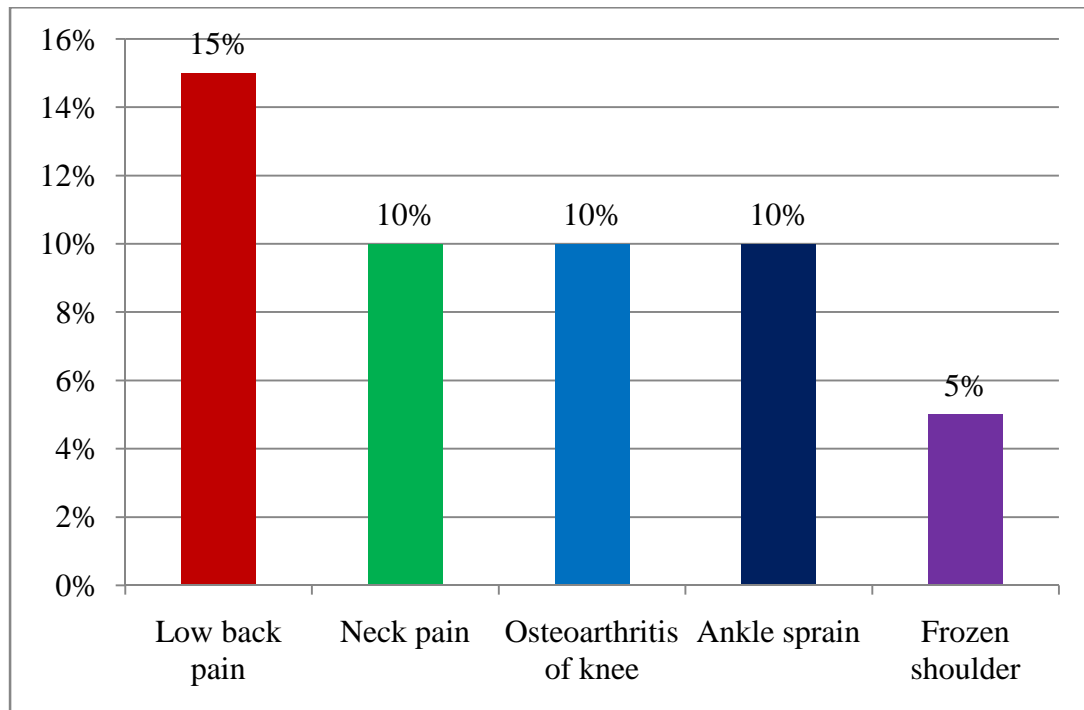
Figure-2: Associated musculoskeletal disorders except main musculoskeletal disorders of the obese.

4.5 Hypertension and diabetes of the obese

Among 20 obese musculoskeletal patients, most of them sheared that they had no hypertension (13, 65%) and diabetes (17, 85%) where rest of the patients suffered with hypertension (7, 35%) and diabetes (3, 15%) which represented in Figure-3.
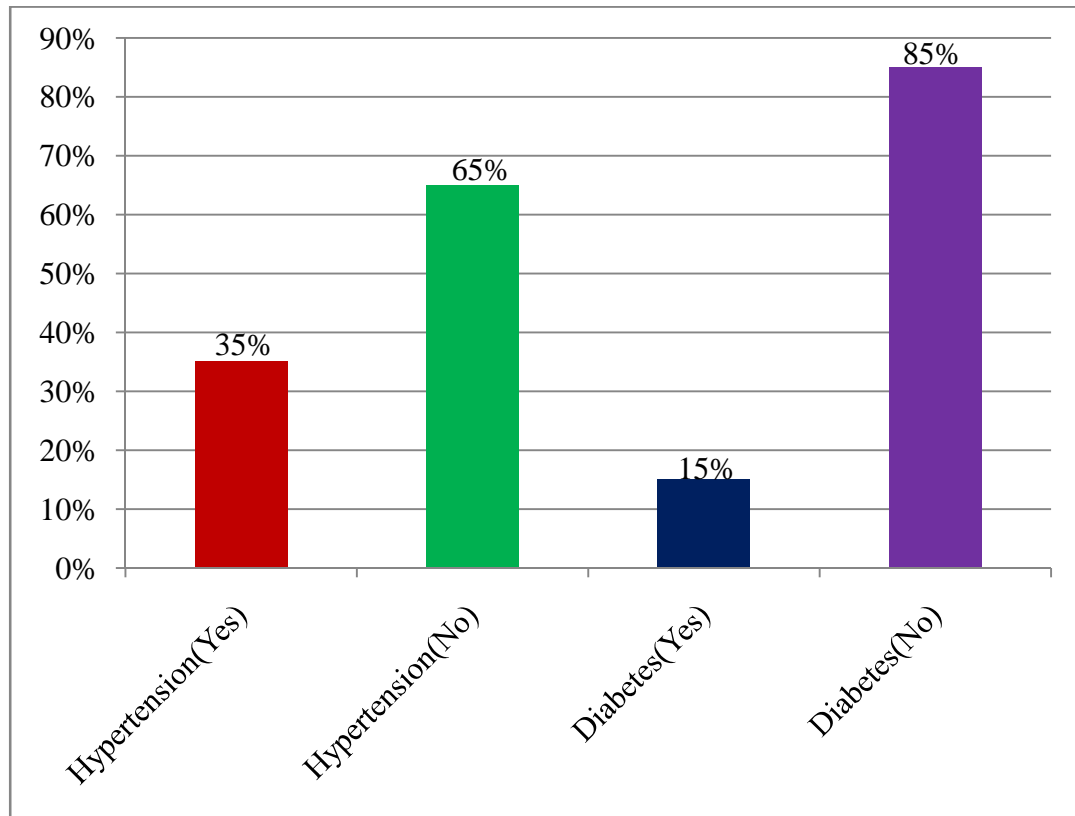

Figure-3: Distribution of hypertension and diabetes of the obese patients.

CHAPTER-V	DISCUSSION

The study found that among 162 musculoskeletal patients, 12.3% (BMI ≥ 30 kg/m2) were obese and 39.5% (BMI 25-29.9 kg/m2) were overweight which is under risk of being obese. At this level, the obesity prevalence in musculoskeletal department at CRP was higher than that in France (7%) and United Kingdom (9%) but lower than that in the United States (20.9%) (Laurier et al, 1992). Hedley et al (2004) in the National Health Assessment and Nutrition Examination Survey for 1999 through 2002 found that about 65% of American adults were overweight or obese: 30% were overweight (BMI ≥ 25 kg/m2) and 35% were obese (BMI ≥ 30 kg/m2). The huge difference of the prevalence of obesity with America because it was the overall national prevalence of obesity among Americans compared with the result of this study which covered the small area of Bangladesh. Another reason was life-style, food habit, alcohol consumption of the American. A study based on National Health Survey of Pakistan (1990–1994) the prevalence of obesity was 10.3% (BMI ≥ 27 kg/m2) (Jafar et al, 2006). Ministry of Health Malaysia (1996) reported in the Second National Health and Morbidity Survey in 1996, that study found an overall prevalence of obesity of 12.3%. Above all the results are nearly similar to this study.

This study showed that 55% obese who were equal or greater than fifty years old and 45% obese who were less than fifty years old and. It indicates that prevalence of obesity increase with age. A study found that for males, the prevalence of obesity increased with age and peak at age 40-49 years and for the females, the prevalence of obesity also increase with age but peak at 50-59 years (Rao & Scott, 1984). Another study was done in 14 provinces in China in population of age 35-85 shows the highest total prevalence of obesity 13.94% (Cheng et al, 2005). The 2004 Survey of Health, Ageing and Retirement in Europe shows that the prevalence of obesity (BMI >or=30) over 50 years of age ranges from 12.8% to 20.2% in Sweden and 12.3% to 25.6% in Switzerland (Andreyeva et al, 2007). So Obesity prevalence rates were also higher in adults with the age. This may be due to increased sedentary lifestyle with age accompanied by a change in body composition leading to higher lean body mass proportion.

The results also showed that the prevalence of obesity was higher in females 60% as compared to 40% in males. Ministry of Health Malaysia (1996) also showed that the prevalence of obesity was significantly higher in females 13.8% as compared to 9.6% in males. Similar result estimated in Pakistan where 18.8% male and 25.5% female. Another study of Health survey for England 2006 found that 23.7% men and 24.2% women were obese (BMI ≥ 30) (WHO, 2005).

The study also found that musculoskeletal complain of obese is more in weight bearing joint of lower limb (osteoarthritis of knee 50%, ankle sprain and calcaneal spur were respectively 5%) and lower back region (low back pain 35%). Sturmer et al. 2000 reported that the risk of osteoarthritis, specifically of the medial tibiofemoral or patellofemoral compartment (but not the lateral compartment), increases with increasing BMI. In a cross-sectional study of almost 13,000 men and women in the Netherlands, a BMI greater than 25 carried a 14% to 48% higher risk of low back pain (Han et al, 1997). Another study showed that the prevalence of low back pain of obese in Saudi Arabia 30% (Al-Shammari et al. 1994). The difference of result of the study due to different studies has used different cut points for overweight and obesity. Some did not use the World Health Organization–recommended BMI cut points to define overweight and obesity.

The study also found that among 20 obese participants 10 (50%) participants had two or more associated musculoskeletal disorder along with main musculoskeletal disorder. The study suggests that obesity was one of the most important risk factor for developing musculoskeletal disorders.

The study found that most of them sheared that they had no hypertension (13, 65%) and diabetes (17, 85%) where rest of the patients suffered with hypertension (7, 35%) and diabetes (3, 15%). Result indicates that the percentage of hypertension and diabetes were not elevated with the BMI.

CHAPTER-VI	CONCLUSION

The prevention and control of obesity in developing countries deserve urgent attention since the disease is expected to double in these countries in the next 20 to 25 years. The problems of obesity in Bangladesh is also increasing day by day as like as the whole world. From the perspective of Bangladesh overweight and obesity can turn into big social issue. As the problem of obesity has increased substantially in the past decade, there is an urgent need for a national strategy for health promotion towards the reduction of overweight and obesity among the Bangladeshi people. Study indicated that prevalence of obesity increase with age. The result shows that prevalence of obesity more in female (60%) than male (40%). Study also indicated that majority of obese suffered with osteoarthritis of knee (50%) and low back pain (35%). Though study showed that the prevalence of obesity of 12.3% but still near half of the participants were overweight (39.5%) which are under risk of being obese. If it happens in future, it will create great impact on national health policy as well as on CRP because obesity has been linked with MSDs, hypertension and diabetes mellitus.

Government and also authorities of CRP need to plan about the awareness program in different area of our country as well as in CRP for preventing the obesity and controlling the musculoskeletal disorder. Continued and regular study in this area should play an essential part in improving quality of life of obese patients.

REFERENCES

- Al-Shammari SA, Khoja TA, Kremli M, and Al-Balali S, 1994, Prevalence of low back pain among obese, Saudi Arabia Medical Journal, 15: 223.

- Andreyeva T, Michaud PC, and Van Soest A, 2007, Obesity and health in Europeans aged 50 years and older, Public Health, 121(7): 497-509.

- Aro S, and Leino P, 1985, Overweight and musculoskeletal morbidity: A ten-year followup, International Journal of Obesity, 9:267–75.

- Aronne LJ, 1998, Obesity, Medical Clinics of North America, 82:161–181.

- Bailey DM, 1997, Research for the health professional: a practical guide, F.A Davis Company, Philadelphia.

- Becker J, Nora DB, Gomes I, Stringari FF, Seitensus R, Panosso JS and Ehlers JA, 2002, An evaluation of gender, obesity, age and diabetes mellitus as risk factors for carpal tunnel syndrome, Clinical Neurophysiology, 113(9):1429-34.

- Berger RG, 2001, The Role of Analgesics in the Management of Osteoarthritis, American Journal of Therapeutics, 1:75-90.

- Bjorntorp P, 1998, Obesity: a chronic disease with alarming prevalence and consequences, Journal of Internal Medicine, 244:267–269.

- Bliss SJ, Flanders SA, and Saint S, 2004, Clinical problem-solving. A pain in the neck, New England Journal of Medicine, 350:1037–1042.

- Bray GA, 1985, Complications of obesity, Annals Internal Medicine, 103(6):1052-1062.

- Bray GA, and Popkin BM, 1998, Dietary fat intake does affect obesity, American Journal of Clinical Nutrition, 68:1157–1173.

- Bruce AJ, Keller JN, and Morrison CD, 2009, Obesity and vulnerability of the CNS, Australian Journal of Surgery, 13:395–400.

- Buckwalter JA, Goldberg VM, Woo SL, and Rosemont IL, 1993, Musculoskeletal Soft Tissue Aging: Impact on Mobility. American Academy of Orthopedic Surgeons Symposium, Journal of Manipulative Physiotherapy, 17:601–4.

- Chen J, Zhao XL, Wu F, Cui YL, and Hu DY, 2005, Epidemiology of obesity and overweight and relation there to the prevalence of hypertension in 14 provinces/municipality in China, Asia Pacific Journal of Clinical Nutrition, 85(40):2830-4.

- Comuzzie AG, and Allison DB, 1998, The search for human obesity genes, Science, 280:1374–1377.

- Coyte PC, Asche CV, Croxford R, and Chan B, 1998, The economic cost of musculoskeletal disorders in Canada, Arthritis Care & Research, 11(5):315-325.

- Felson DT, 1996, Weight and Osteoarthritis, American Journal of Clinical Nutrition, 63:430-432.

- Finkelstein EA, Chen H, Prabhu M, Trogdon JG and Corso PS, 2007, The relationship between obesity and injuries among U.S. adults, American Journal of Health Promotion, 21:460–8.

- Goetzel RZ, 2003, The health and productivity cost burden of the "top 10" physical and mental health conditions affecting six large US employers in 1999, Journal of Occupational Environmental Medicine, 45(1):5-14.

- Goldin RH, McAdam L, Louie JS, and Bluestone R, 1976, Clinical and radiological survey of the incidence of osteoarthritis among obese patients, Annals Rheumatic Disease, 53:349-353.

- Grundy SM, 1998, Multifactorial causation of obesity: implications for prevention , American Journal of Clinical Nutrition, 67:563–572.

- Han TS, Schouten JS, Lean ME, and Seidell JC, 1997, The prevalence of low back pain and associations with body fatness, fat distribution and height, International Journal of Obesity Related Metabolic Disorder, 21:600–607.

- Hedley AA, Ogden CL, Johnson CL, Carroll MD, Curtin LR, and Flegal KM, 2004, Prevalence of overweight and obesity among US children, adolescents, and adults, 1999–2002, Journal of America Medical Association, 291:2847–2850.

- Hellman J, and David B, 1998, Arthritis and Musculoskeletal Disorders, In Current Medical Diagnosis and Treatment, 35(7):343-345.

- Hill JO, 1998, Genetic and environmental contributions to obesity, American Journal of Clinical Nutrition, 68:991–992.

- Jafar TH, Chaturvedi N, and Pappas G, 2006, Prevalence of overweight and obesity and their association with hypertension and diabetes mellitus in an Indo-Asian population, Indian Journal of Medicine, 175(9):107.

- Karpitskaya Y, 2002, Prevalence of smoking, obesity, diabetes mellitus, and thyroid disease in patients with carpal tunnel syndrome, Annals Plastic Surgery, 48(3):269-73.

- Keys A, Fidanza F, Karvonen MJ, Kimura N, and Taylor HL, 1972, Indices of relative weight and obesity, Journal of Chronic Diseases, 25:329–43.

- Ko GT, and Tang JS, 2006, Prevalence of obesity, overweight and underweight in a Hong Kong community: the United Christian Nethersole Community Health Service (UCNCHS) primary health care program 1996-1997, Asia Pacific Journal of Clinical Nutrition, 15(2):236-41.

- Koleva M, and Kostova V, 2003, Occupational and personal risk factors for musculo-skeletal disorders in fertilizer plant workers, Central European Journal of Public Health, 11(1):9-13.

- Kortt M, and Baldry J, 2002, The association between musculoskeletal disorders and obesity, Australian Health Review, 25(6):207-14.

- Kostova V, and Koleva M, 2001, Back disorders (low back pain, cervicobrachial and lumbosacral radicular syndromes) and some related risk factors, Journal of Neurological Science, 192:17–25.

- Kouyoumdjian JA, 2002, Evaluation of age, body mass index, and wrist index as risk factors for carpal tunnel severity, Muscle Nerve, 25:93-99.

- Laurier D, Guiquet M, and Chau NP, 1992, Prevalence of obesity. A comparative study in France, the United Kingdom and the United States, International Journal of Obesity Related Metabolic Disorder, 16(8):565-72.

- Leach RE, Lindgren B, Baumgard S and Broom J, 1973, Obesity: its relationship to osteoarthritis of the knee, Clinical Orthopedic, 93:271-273.

- McGoey BB, Dietel M, Saplys RJF, and Kliman ME, 1990, Effect of weight loss on musculoskeletal pain in the morbidly obese, Journal of Bone Joint Surgery, 72:322-323.

- Ministry of Health Malaysia (MOH), 1996, Report of the Second National Health and Morbidity Survey in Kuala Lumpur, Asia Pacific Journal of Clinical Nutrition, 16 (3):561-566.

- National Health Data Committee, 2003, National health data dictionary, Version 12, available:http://www.who.int/ncd_surveillance/infobase/web/InfoBasePolicy Maker/reports/Reporter.aspx?id=3 [viewed 23 March 12].

- National Institute for Occupational Safety and Health (NIOSH), 1997, Annual report 1997, available: http://www.cdc.gov/niosh/muskdsfs.html [accessed 15 July 12].

- National Institute of Population Research and Training (NIPORT), 2004, Demographic and health survey Bangladesh, Dhaka, Bangladesh, available: http://www.ic.nhs.uk/pubs/hse06trends [accessed on 16 July 12].

- Part R, 2009, Musculoskeletal disorders of the knee of workers, available: http://www.ncbi.nlm.nih.gov/pubmed/19961084, [accessed 3 June 12].

- Pavelka K, 2000, Treatment of Pain in Osteoarthritis, European Journal of Pain, 2:23-30.

- Petty NJ, and Moore AP, 2004, Principles of neuromusculoskeletal treatment and management: a guide for therapists, Churchill Livingstone, London.

- Pi-Sunyer FX, 1993, Medical hazards of obesity, Annals Internal Medical, 119(7):655-660.

- Pope MH, Bevins T, Wilder DG, and Frymoyer JW, 1985, The relationship between anthropometric, postural, muscular and mobility characteristics of males ages 18-55, Spine, 10:644-8.

- Prentice AM, and Jebb SA, 1995, Obesity in Britain: gluttony or sloth? British Medical Journal, 311:437–439.

- Rao JNK, and Scott AJ, 1984, On Chi-squared tests for multiway contingency tables with cell proportions estimated from survey data, Annals of Statistics, 12:46-60.

- Rippe JM, and Hess S, 1998, The role of physical activity in the prevention and management of obesity, Journal of the American Dietetic Association, 98:31–38.

- Rosenbaum M, Rising R, Leibel LR, and Hirst J, 1997, Obesity, New England Journal Medicine, 337:396–407.

- Seidell JC, 2000, Obesity, insulin resistance and diabetes—a worldwide epidemic, British Journal of Nutrition, 83(1):5–8.

- Seiler F and John N, 1997, Carpal Tunnel Syndrome: Update on Diagnostic Testing and Treatment Options, Consultation, 37(5):1233.

- US Department of Health and Human Services, 2004, Annual report 2004, available: http://www.cdc.gov/od/oc/media/pressrel/fs040309.htm, [accessed on 16 August 12].

- Waddell G, 2004, The Back Pain Revolution, Churchill Livingstone, Edinburgh.

- Weinsier RL, Hunter GR, Heini AF, Goran MI, and Sell SM, 1998, The etiology of obesity: relative contribution of metabolic factors, diet, & physical activity, American Journal of Medicine, 105:145–150.

- WHO (World Health Organization), 2004, Appropriate body-mass index for Asian populations and its implications forpolicy and intervention strategies, The Lancet, 363:157–63.

- WHO, 2008, The global burden of disease: 2004 update. Geneva: World Health Organization,available:http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsStatistics/DH_4138630 [accessed on 11 April 12].

- Willett WC, 1998, Is dietary fat a major determinant of body fat?, American Journal of Clinical Nutrition, 67:556–562.

- Williamson DF, 1996, Dietary intake and physical activity as 'predictors' of weight gain in observational, prospective studies of adults, Nutrition Reviews, 54:101–109.

- World Health Organization, 1998, Preventing and Managing the Global Epidemic. Report of a World Health Organization Consultation on Obesity, The Lancet, 363:157–63.

- World Health Organization, 2005, What is the scale of the obesity problem in your country,available:http://www.who.int/ncd_surveillance/infobase/web/InfoBasePolicyMaker/reports/Reporter.aspx?id=3 [accessed on 26 May 2012].

- Yelin E, 1997, The earning, income, and assets of persons aged 15-61 with and without musculoskeletal condition, Journal of Rheumatology, 24(10):2024-2030.

INFORMED CONSENT (Bengali)

মৌখিক অনুমতি পত্র

(অংশগ্রহনকারীকে পড়ে শোনাতে হবে)

আস্সালামুওয়ালাইকুম/ নমস্কার, আমার নাম মোঃ সালাহউদ্দিন । আমি এই গবেষণাটি বাংলাদেশ হেলথ্ প্রফেশনাল ইন্সটিটউট (বি এইচ পি আই) এ করছি যা আমার অধিভুক্ত। যার শিরোনাম হল-" সিআরপি-তে মাসকিউলোস্কেলিটাল বিভাগে চিকিৎসা নিতে আসা স্থুলকায় রোগীদের হার " । আমি এক্ষেত্রে কিছু ব্যক্তিগত এবং আনুষঙ্গিক প্রশ্ন করে আপনার সমস্যা সম্পর্কে জানতে চাচ্ছি। যা আনুমানিক ০৫-১০ মিনিট সময় নিবে। আমি আপনাকে অবগত করছি যে, এটা আমার অধ্যয়নের অংশ এবং অন্য কোন উদ্দেশ্যে এটা ব্যবহৃত হবে না । তাই এই গবেষণায় অংশগ্রহণ আপনার বর্তমান এবং ভবিষ্যৎ চিকিৎসায় কোন প্রভাব ফেলবে না । আপনি যে সব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে এবং আপনার প্রতিবেদনের ঘটনাপ্রবাহে এটা নিশ্চিত করা হবে যে, এই তথ্যের উৎস অপ্রকাশিত থাকবে ।

এই অধ্যয়নে আপনার অংশগ্রহণ স্বেচ্ছাপ্রণোদিত এবং আপনি যে কোন সময় এই অধ্যয়ন থেকে কোন নেতিবাচক ফলাফল ছাড়াই নিজেকে প্রত্যাহার করতে পারবেন । এছাড়াও কোন নির্দিষ্ট প্রশ্ন অপছন্দ হলে উত্তর না দেয়ার এবং সাক্ষাৎকারের সময় কোন উত্তর না দিতে চাওয়ার অধিকার আপনার আছে ।

এটা শুরু করার আগে আপনার কোন প্রশ্ন আছে?

আমি আপনার অনুমতি নিয়ে এই সাক্ষাৎকার শুরু করতে যাচ্ছি? হ্যাঁ ☐   না ☐

উত্তরদাতার স্বাক্ষর ....

গবেষকের স্বাক্ষর ....

সাক্ষীর স্বাক্ষর ....

INFORMED CONSENT (English)

Title: Prevalence of obesity among the musculoskeletal patient's attending the musculoskeletal department of CRP.

Thanks in advance for being a part of my study. My name is Md. Salahuddin. I am a student of Bangladesh Health Professions Institute (BHPI), CRP. As a part of my academic course requirement I need to conduct a research work. The aim of my research topic is to find out the Prevalence of obesity among the musculoskeletal patients attending the musculoskeletal department of CRP. This will be a Cross sectional type of study and will helpful for obese person. I assure you that all data will be kept confidential. In report information will be presented in the form of group. No name will be mentioned. For your information Bangladesh Health Professions Institute (BHPI), CRP has permitted me to do the research.

Your co-operation in answering a few questions will be highly appreciated. If you kindly permitted then only shall I start. Shall I start? ☐ Yes   ☐ No

With Thanks

Name of the Interviewer:…..

Signature of the Researcher:......................................

Name of the attendance:…………………………...

Title: Prevalence of obesity among the musculoskeletal patients attending the musculoskeletal department of CRP.

Data collection instrument: Questionnaire

ID NO: | | | | DATE OF INTERVIEW: | | | | | | |

PLACE OF DATA COLLECTION:

0	
1	
2	

PART- A (SOCIO-DEMOGRAPHIC QUESTIONS)

Serial No.	Question	Coding Category
1.	What is your current age? (In years)	
2.	Sex	0 = Male 1 = Female
3.	Weight in Kg:	
4.	Height in meter:	
5.	BMI= Weight in Kg/ (Height in meter)2	
6.	Body mass index (BMI)	0 = Underweight (< 18.5) 1 = Normal range (18.5 to 24.9) 2 = Overweight (greater than or equal to 25) 3 = Pre-obese (25.0 to 29.9) 4 = Obese class 1 (30.0 to 34.9) 5 = Obese class 2 (35.0 to 39.9) 6 = Obese class 3 (greater than or equal to 40.0)

PART-B (OBESITY AND MUSCULOSKELETAL PROBLEM RELATED QUESTIONS)

Serial No.	Question	Coding Category
7.	For which problem do you come to CRP?	
8.	What are the other problem do you suffer now?	0 = Low back pain(LBP) 1 = Neck pain 2 = Spondylolisthesis 3 = Spondylosis 4 = Spondylolysis 5 = Disc protrusion 6 = Osteoarthritis of knee 7 = Osteoarthritis of hip 8 = Ankle sprain 9 = Shoulder capsulitis 10 = Carpal tunnel syndrome(CTS) 11 = Quadriceps weakness 12 = Rotator cuff tendinitis 13 = DeQuervain's Disease 14 = Trigger finger 15 = Thoracic Outlet Syndrome
9.	Do you have hypertensive?	0 = Yes 1 = No 2 = Unchecked
10.	Do you have diabetes mellitus?	0 = Yes 1 = No 2 = Unchecked

Permission letter

Date:23.07.12

To

The Head of the Department,

Department of Physiotherapy,

CRP ,Savar, Dhaka .

Subject: Prayer for permission of data collection for research.

Sir ,

I beg most respectfully to state that I am a student of 4th year, B Sc in Physiotherapy.I am doing research on "Prevalence of obesity among musculoskeletal patient attending at musculoskeletal department of CRP " as a part of our course curriculum , under supervision of Mohammad Millat Hossain ,Lecturer of Physiotherapy Dep. of BHPI. I want to collect data from the musculoskeletal department of CRP, Savar, Dhaka.

I therefore, pray and hope that you would be kind enough to grant me and thus oblige thereby.

Sincerely yours ,   *Salahuddin*
                      24.07.2012
Md.Salahuddin

4th year, Roll-17,

Department of Physiotherapy,

BHPI,CRP,Savar, Dhaka.