A STUDY TO ASSESS THE EXTENT OF SELECTED PHYSICAL PROBLEMS FACED BY YOUTH DUE TO USAGE OF LAPTOP/COMPUTER

JUNE 2021 **PAYAL SALEKAR**

A STUDY TO ASSESS THE EXTENT OF SELECTED PHYSICAL PROBLEMS FACED BY YOUTH DUE TO USAGE OF LAPTOP/COMPUTER

A Dissertation

Submitted to

The Maharaja Sayajirao University of Baroda, Vadodara

In partial fulfillment for

The Degree of Masters in Family and Community Sciences

(Family Economics and Resource Management)

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Vadodara

JUNE 2021

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ACKNOWLEDGEMENT

First, I am thankful to god for giving me the ability, strength, capacity and resources to prepare this Dissertation. It is a genuine pleasure to express my deep sense of thanks and gratitude to my research guide, Dr. Mona Mehta to give me her precious time.

I own a deep sense of gratitude to Prof. Neerja Jaiswal, Head of Department of Family and Community Resource Management Dr. Sarjoo Patel, Dr. Urvashi Mishra and Dr. Shilpi Saraswat for their suggestions with kindness throughout the presentations. I am thankful to Ms. Vashima Veerkumar and Ms. Neha Rathore for their valuable suggestions.

I profusely thank to all the non-teaching staff of the Department of Family and Community Resource Management for making required resources available to me.

I am extremely thankful to Mrs. Sushma Parekh, for her suggestions and help in statistical analysis.

Most importantly, I am thankful to my dear parents, Mr. Ramesh J. Salekar and Mrs. Shubhangi R. Salekar, without their love, affection and support none of this would have been possible.

My heartfelt thanks to my family, friends and classmates for their support and encouragement.

I am thankful to all the respondents for giving their precious time for data collection which were important for the completion of the dissertation. I am truly thankful to all those who helped me in making my work worth presentable.

Payal Salekar

Introduction

CHAPTER-1

INTRODUCTION

Youth

Youth is best understood as a period of transition from the dependence of childhood to adulthood's independence. Youth is more fluid than other fixed age-groups. Age is the easiest way to define this group, particularly in relation to education and employment, because 'youth' is often referred to as a person between the age of leaving compulsory education and finding their first job. The United Nations, for statistical purposes, defines 'youth', as those persons between the ages of 15 and 24 years, without prejudice to other definitions by Member States [1].

Youth is also defined by some, especially in western societies as the "life stage between childhood and adulthood" and becoming independent from dependent (Kehily, 2007). Definitions of youth by age vary drastically across different institutions; the UN has defined youth as person from 15 to24 years of age, whereas the National Youth Policy of Nepal defines youth as persons between the age group of 16 to 40 years. [2]

Technology and gadgets are now indispensable in the daily lives of youth today. Technology helps advance humans forward by doing mundane things that are more efficient and repeatable. Technology has brought about a great change in the field of information revolution. The technological advances have evolved to be so powerful and smart that it feels like having a super-computer on one's hands. Humans now have an insatiable appetite for information at their fingertips. When technology makes this happen, the natural tendency is for this to become an expectation. Gadgets equipped with internet have transformed the lives of youth in several ways and brought about a paradigm shift in our dependence on technology to perform key tasks in our everyday routine (Indrakanti et al., 2018).

Statistics from the United States suggest that young people spend on an average 7 hours and 38 minutes per day engaging with media content (Rideout et al., 2010).

Social media has become an integral part of daily routine around the world. On average, an internet youth spends two hours and twenty-two minutes on social media in a day globally. In many countries worldwide, the Global Web Index report has revealed that emerging markets are spending more time on social media in a day on an average. [3]

The average for office work youth will spend almost 1,700 hours a year in front of a computer screen, a poll has found. A study into screen time at work has revealed office workers will spend an average of 6 and a half hours a day sat at their computer or laptop.[4] About 28 per cent of Indians spend over eight hours per day in front of one screen or another during the week, says a recent Titan Eye plus survey. [17]

Reasons for usage of laptop/computer by the youth

During the last 3 decades, computer has been recognized as the most life changing and successful invention solving problems in human life. Today, there were find applying computer usage at educational sector, health, transportation, or communication sector, can see the influence and application of computer**.** [5]

There are several reasons for usage of laptop/computer by the youth viz. study, communication, entertainment and office work. Common uses for the laptop/computer by the youth include taking notes or researching papers, presenting information in business meetings, accessing data away from home or the office, playing games or watching movies while travelling, accessing the internet in a public place, sending and receiving email in public place.[20]

The use of laptop/computer for the students are for various reasons like to take notes in class, type up assignment, share notes, and work with groups on

projects [18]. Libraries have gone digital, so youth have access larger amount of information virtually anywhere.[5]

The use of computer can also bring people closer together and facilitate contacts between them using Email, Chatting, Videoconferencing, Social Medias. It saves time, efforts and money.[5]. Along with texting, youth are incorporating several other devices, communication platforms and online venues into their interactions with friends, including: Instant messaging, Social media, Email, Video chat, Video games, Messaging apps (Lenhart et al.,2015)

Additionally, laptop/computer can also be used for various entertainment purpose as it can relate to internet wherein it has ability to published ideas, thoughts, criticism etc., instantly across the world. Most college students cannot have a day without login into at least one social networking sites like Facebook, Twitter, blogger, YouTube, WhatsApp etc. [5] Young people have shown preferences for using the internet for gaming, chatting and social networking purpose (Durkee et al., 2012).

For office work laptops are continuously being used in companies where they are engaged in many productive tasks such as web marketing etc. It is the best place where the important information of the business can be stored for a longer period.[6] Laptops are helpful in clear marketing presentations, flexibility at work-doing work at whatever location is needed that day etc. [26]

Nowadays, the development of technology along with the need to access information has resulted in use of personal computer to be inevitable. However, the nature of working with laptop/computer in one hand and not paying attention to occupational health and their ergonomics principles during the work and prolong time spent with the computer, on the other hand, have led to the high prevalence and serious musculoskeletal disorders(MSDs) in computer and laptop users. Youth spend a couple of hours a day in front of a computer without thinking about the impact on their physical health. They physically stress their bodies daily without realizing it by extending their wrists, slouching, sitting without

foot support and straining to look at poorly placed monitors for hours together daily.[7]

Physical problems faced by youth due to usage of laptop/computer

Musculoskeletal Discomfort

The musculoskeletal discomfort refers to pain in the muscles, ligaments and tendons and sometimes entire body ache (Ardahan and Simsek, 2016). Work related musculoskeletal discomforts (WMSDs) are type of discomforts that affect different parts of the body that are associated with movements, including the upper limbs, lower limbs and back. These affect the different structure of the body such as tendons, joints, muscles and nerves and primarily caused or aggravated by work-related activities (Nunes and Bush, 2012). The musculoskeletal discomfort can be assessed by standardized questionnaire viz. Nordic Musculoskeletal Questionnaire (NMQ) and Cornell Musculoskeletal Discomfort Questionnaire (CMDQ). Experiencing these discomforts in different body parts for a longer period may lead to musculoskeletal disorders (Buckle and Devereux, 2002). Musculoskeletal disorders (MSDs)are injuries or pain in the human musculoskeletal system, including the joints, ligaments, muscles, nerves, tendons, and structures that support limbs, neck and back [28]. (Kuorinka et al., 1987), MSDs can affect many different parts of the body including upper and lower back, neck, shoulders and extremities (arm, legs, feet, and hands).

When using a laptop people do simply place it on their desk or their laps. This might be okay for a short while, but any time longer, and neck and shoulder will start to feel it. According to studies, even a 15˚tilt of the neck to look down at the laptop screen doubles the amount of force exerted on our necks to hold up the head. If place laptop on lap, that force can be 3times as great compared to a straight neck. Dr. Kenneth Hansraj, in his research found that, even though the human head only weighs 10 to 12lbs on average, the weight drastically increase as the head tilts forward. At a 15˚angle, the wight jumps to 27lbs, 40lbs at 30˚,

49lbs at 45˚ and 60lbs at 60˚. Motion of looking down seem harmless, doing it for long period of time can lead to **neck pain**, **upper back muscle spasms**, and even **damage the vertebrae**. Studies have shown that frequent twisting of the neck to utilize dual monitors can also lead to neck pain and other necked related musculoskeletal disorders.[21]

Back pain is the most common work-related disability. Office chairs that don't support body properly and have poor body alignment can create pressure on various areas of spine. They can contribute to pain in **back**, **neck**, **shoulder** and even **arms**. Sitting in any position for more than twenty minutes contributes to back pain by reducing the flexibility of tendons and ligaments.[8]

Computer or mouse elbow is basically the same condition as tennis elbows. It's a repetitive stress injury characterized by muscle pain, tendon pain, or a combination of both. Known medically as lateral epicondylitis, it is caused by repetitively gripping and squeezing an object. In the case of computer **elbow**, the object is the mouse are constantly holding onto and moving daily. Although using mouse is hardly a strenuous activity like tennis, over time it can cause the extensor muscles in forearm to become fatigued and start to wear down. This causes muscles to contract and constrict resulting in pain in the outer portion of elbow that can extend down **forearm** into **wrist and hand**.[22]

Keyboard and moussing may not be considered strenuous activities, but if done incorrectly over time, they can damage the **wrist and hand**. Not working properly at the keyboard, chances are the first sign will be **back pain**, **neck pain**, **soreness** or **stiffness**. Eventually, the pain extends into the **shoulders, forearms, wrist and hands**. **Numbness** and **tingling** might suggest nerve problems (Richard, 2013). The keyboard on most laptops are flat, which causes our wrists/hands to flex downwards (called wrist flexion) while typing. This position, unfortunately, is one of the worst for wrist/hand ergonomics.[9]

Occasional twinge or an ongoing ache, back pain can keep from performing at best. Sitting chained to desk for hours at a time can lead to **lower back pain**, the most common work-related back problem.[23]

Over time, being sitting in a bent position on daily basis from desk at work to couch at home- shortens hip flexors, a group of muscles located at the front of **hips**, causing pain. Tight hip flexors also contribute to **lower back soreness.**[10] Ankle **pain** can be referred from pressure on the nerves in the lower back. Most joints are at their most comfortable at a position midway between fully bend and fully extended.[11]

Limiting computer use to less than three–fourth of the work time would help to prevent hand–wrist symptoms, low influence at work predicts both neck and hand–wrist symptoms (Jensen, 2003). Hand rest and wrist support can successfully reduce muscle fatigue in specific upper limb muscles during prolong typing, leading to a muscle–selective reduction in the occurrence of fatigue and thus provide direct evidence that they may prevent work–related musculoskeletal disorders (Callegari et al., 2017). The use of arm support with alternative mouse may reduce the incidence of neck/shoulder MSDs. The incidence of neck/shoulder and right upper limb MSDs is not reduced when comparing alternative and conventional mouse with and without arm support (Hoe et al., 2012). This musculoskeletal discomforts in several body parts are interconnected with adaptation of posture while using laptop/computer.

Posture Related Problems

Posture is the mechanical relationship of the parts of the body to each other (Tattersal and Walshaw, 2003). Posture refers to the alignment and maintenance of body segments in certain positions (Rosario et al., 2013). Good posture, pertains to the training of body to walk, stand, sit and lie with the slightest strain on the ligaments and muscles.[30] (Kappler, 1982) According to kappler, a good posture creates less stress on the joints, requires less muscle activity to maintain balance and, therefore, is the position of maximum effectiveness. An imbalanced

posture must be compensated by changes in joint positions which, in turn, must be maintained by an increase in muscle activity, leading to injuries. Postural imbalance results in increased energy consumption.

Neck or eye problems from typing to see the screen at an awkward angle, Wrist and hand problems from bending wrists to use the keyboard, or from over using the other input devices (mouse, nipple, roller ball, pad etc.), shoulder or back problems from carrying the laptop or from reaching too for use it, or from using it extensively in an unusual posture such as slouching, bending over or lying down. [12]

During the performance of work, the person changes the posture. Uncomfortable work posture leads to more frequency of postural changes. More the number of postural changes, during work, more is the fatigue caused to the person. Due to the inherent portability of laptops, users especially in non-official places are applying this device in different postures, to the extent that some of them are unfavorable situations in terms of ergonomics basis (Heidari et al.,2019).

Reason for **neck and shoulder pain** is poor sitting posture, after sitting for a while, many people's natural inclination is to start leaning on the desk for support, hunching their shoulders and craning their neck forward. In medical terms, the forward neck crane occurs when the head is far ahead from the center of the shoulders. This can happen due to fatigue, or if the computer monitor is placed too far for eyes to view easily. A forward head posture over stretches the muscles, reduces balance and leads to chronic neck pain. It is often accompanied by upper crossed syndrome where the shoulders and upper body are hunched forward. A lack of upper body movements at regular intervals will lead to neck pain after a while. Office chair sitting in is an especially a factor if sit for hours on end staring at the computer. Most task and mid back office chairs lack a headrest, which is a not necessary to get into an ergonomically sound sitting posture with the neck straight and at a neutral position. If sit for a long time without taking breaks, it becomes difficult to maintain that posture. Neck and shoulder pain will start to creep up. Most of us work with paper documents and

our computer at the same time. This also seem harmless, but the motion of constantly looking up/down or to the side to switch between the computer screen and documents are another reason for neck pain. Sometimes wake up with a stiff neck, then poor quality or lack of sleep is one of the reasons for neck pain during office hours. Sleep efficiency also amplifies any existing pain already be feeling, such as neck pain.[21]

If spines neutral position is upright, shoulder back and a slight curvature at the spine. Leaning too far forward, bending head too low, or dangling feet to high can all case spine issues and **upper back pain**.[8] If mouse is too high or too far away, it will be forced to repeatedly overextend forearm to use it, increasing risk of injury. Mouse should be positioned at side with arm close to body. A straight line should be maintained between hand and forearm. Mouse need fits according to hand, if it's too small, finger, hand and wrist muscles will have to remain in a tense position to use it. If Keyboard placed directly front of user, wrists should be extended straight, not bent up or down. If raise the back of keyboard- it increases the strain on wrists. Increasing muscle strength can help prevent computer elbow from occurring in the first place or recurring in the future.[22]

Over time repetitive action such as those involved in keyboarding can put a strain on the muscles, tendons and nerves in the **arm, wrist, finger and hand**. Wrist pressing against the hard edge of a table or desk and if they are high user must bend them to reach the keyboard. It can pain. If keyboard is placed further back on desk user inadvertently rest arms on the desk, which can also cause strain.[27] (Cook et al., 2013), There is evidence that provision of forearm support using a conventional straight edge desk is beneficial to both keyboard and mouse users, irrespective of whether a wrist rest is used. Upper extremity muscle load is decreased, as is lateral deviation of the wrist. Forearm support appears to have minimal effect on wrist extension during keyboard and mouse use.

The factors contribute to pain and discomfort are repetitive movements of the fingers (such as in keyboarding), prolonged holding and clicking of the mouse,

keyboard habits (those who have a habit of striking the keyboard hard will have a great tendency towards finger pain), positioning of arms while keyboarding. When symptoms appear in the forearm it is generally referred to as Tennis Elbow. [13]

Slumping back in desk chair or slouching forward means users spine is out of alignment. That puts a strain on the ligaments and muscles in users **lower back**.[23] Many people lean forward to work with one foot resting on the back of the ankle of the other foot, pressure on the Achilles tendon. This can restrict the flow of nutrients to a tendon, which even under normal conditions has a poor supply.[11]

Sitting on the floor without backrest and laptop located on the knee, sitting on the couch, neck supported with couch handle and laptop placed on the abdomen and thighs were defined as more inappropriate posture and emergency changes are required for preventing of MSDs (Heidari et al., 2019).

(Gautam and Chacko, 2017), in his study on “Impact of laptop usage on symptoms leading to musculoskeletal disorders” found that Prolonged usage in faulty posture have created various musculoskeletal problems. There was a positive correlation between the posture adopted and the incidence of pain.

To prevent from pain in body parts while using laptop/computer for long periods, many good postures are there like, neck should be in a neutral position, and for that place the keyboard and screen could be placed directly in front of user, so that it can help to reduce **neck** pain. One should not sit in a twisted position and overload one side of your body while using mouse for long periods of time, as it is a major cause of **back** and **shoulder** problems. Hips should be as far back in chair as possible in order to adequately support the weight of spine. Instead one should sit up straight with backside right into the back of chair and adjust the backrest so it sits snugly in the small of back, which can help in reduce **lower back** pain. Keyboard should be relatively close to body and directly in front of user so users’ forearms rest on desk. Also, one should keep shoulders and arms

relaxed with the upper arms close to the body. Fraser says, “Your seated elbows height should be approximately the same height as the desk.” It can help in reduce **arms** pain. To maintain straight wrist and reduce strain, have a slightly titled keyboard. If user have small hands, a mouse with low profile prevents the **wrist** bending too much. Adjust the chair so thigs are parallel to the floor. There should be enough space at the front of chair to slip two finger-width underneath: this avoids pressure from the edge of user’s seat. The knee angle should be in 90 degrees, to reduce **thighs** pain. Feet should be well supported, and desk should have enough space beneath to stretch legs. “Check if user’s feet are resting comfortably on the ground or whether they’re dangling and in need of support”.[38]

Vision problems

The American Optometric Association (AOA) defined computer vision syndrome as “a complex of eye and vision problems related to near work experienced during computer use”.[19] It is one of the rising health concerns related to technology due to continuous use of computers among students (Abudawood et al., 2020).

Headaches or migraine attacks from the computer screen are a common occurrence. Most often it is linked to computer vision syndrome, or CVS for short, which specially refers to visual and other symptoms that result from screen exposure and which may affect as many as 90% of computer users. Researches from across the globe have found that between 19% to 53% of those with extended exposure to their PC or laptop screen suffer **headaches** as a frequent side effect, in Many cases, recurring headaches symptoms lasted a week or more. Workers who specifically use the computer as a primary function of their job have also been found to have more headache episodes, although just a few hours of constant use for an extended time period can have the same effect. Intensive viewing for as little as 30 minutes (or even less) may bring on computer vision syndrome symptoms (including headaches). Continuous computer usage -

just two hours a day -can also lead to regular **head pain**. And extended daily exposure (between 4 to 9 hours) can compound the problem.[24]

Dry eyes, caused by a lack of blinking, staring at a screen too long caused **eyestrain.** [14] Due to eyestrain people faced problems like **sore**, **tired**, **burning** or **itching eyes**, **watery** or **dry eyes**, **blurred** or **double vision**, **headache**, **sore neck**, **shoulders** or **back**, increased sensitivity to light, difficulty concentrating, feeling that person cannot keep their eyes open.[15]

Blurred vision, **dry eyes**, **burning sensation**, **redness of eyes** and **headaches** are the main symptoms resulting from improper use of computers (Shantakumari et al.,2014). **Eyestrain**, **Headaches**, **Blurred Vision**, **Dry eyes**, **Neck and shoulder pain** are symptoms associated with computer vision syndrome.[16] CVS related symptoms reduce the productivity of work (Abudawood et al., 2020).

Justification

Laptop and computers are an integral part of our daily lives. Laptop are commonly used in a variety of setting, such as at work, in education, for playing games, wed browsing, for personal multimedia, and general home computer use. The utility of these devices has greatly changed our lives and the way we work, but in turn they have also had a huge impact on our habits and postures. Working with poor posture affects the body posture of youth. The computer use can cause vision problems, the glare on the screen of computer, the reduced level of contrast of text to the background, and letters not being as sharp or clear, this can put more strain on eyes. eye strain, blurred vision, headaches & dry eyes, these symptoms are only temporary and begin to be reduce when not using the computer. The computer addiction can cause physical damage, using mouse and keyboard for many hours every day can lead to the repetitive stress injuries. The back problems are faced due to spend a lot of time sitting at the computer desk, the incorrect locations of computer device can strain shoulders, when mouse and keyboard are positioned person can reach for them, shoulder extend forward and shoulder blades rotate, too much stretches of shoulder muscles can results spasm, fatigue, headache, and the stiffness in the neck and the shoulder, long term effect include severe shoulder pain and muscular imbalance, sit in front of computer for four to six hours straight, Numerous hour of sitting and bad posture would result in back pain, heavy use of hands and wrists for type continuously, stress on fingers, the hands, and the wrists, sit for long time can pain in hips, thigh, knee and feet. Heavy use of hands and wrists for typing continuously, would put stress on fingers, hands, and wrists.

Several studies were found through review of literature focusing on areas such as, “Musculoskeletal pain among computer users” (Oha et al, 2014), “Awareness of good posture and computer ergonomics among medical students” (Hussain et al, 2015), “musculoskeletal disorders among computer users” (Talwar et al, 2009; Saleem et al, 2015; Moom et al, 2015; Amin et al, 2016; Gautam and Chako, 2017; Mahadik et al, 2017; Soto et al, 2017; Bist and Bakshi, 2018; Chako and

Chetan, 2018; Sirajudeen et al, 2018), “Prevalence of dry eyes amongst computer workers” (Mallik et al, 2017), “Computer Professionals and Their Health issues and managements” (Sudharshini et al, 2018), “Musculoskeletal problems among computer users” (Borhany et al, 2018; Ozdinc et al, 2019; Shaikh, 2020), “Musculoskeletal system discomforts among computer users” (Ardhan et al, 2016; Dolen and Elias, 2016; James et al, 2018), “Computer vision syndrome in computer users” (Hassan et al, 2015; Dessie et al, 2018; Abudawood et al, 2020), “Ergonomics posture analysis and related musculoskeletal disorders in laptop users” (Heidari et al, 2019). A dearth of researches was found in India and abroad it is focusing on extent of selected physical problems viz. musculoskeletal discomfort and vision problems faced by laptop/computer usage on the body posture and pain.

Tendonitis is the most common problem, involving tendon inflammation and localized pain in elbow, forearm, wrist or hand. Bad posture can cause fatigue, muscle strain and in later stages pain. Usually years of faulty posture can lead a pain. Poor posture can affect the body posture. This physical health problem can reduce productivity. Therefore, the present research aims to assess the extent of selected physical problems faced by youth due to usage of laptop/computer.

Subjects such as “Ergonomics” is offered by the Department of Family and Community Resource Management, Faculty of Family and Community Sciences, Maharaja Sayajirao University of Baroda at Post Graduation level. The findings of the present research will help to the students of Family and Community Resource Management to gain information related to adopted awkward postures which results in physical fatigue and its effect on the body. This study will be beneficial to enhance the knowledge of practicing Architects, Interior Designers and Builders to design an ergonomically sound workplace. This study on selected physical problem due to usage of laptop/computer would offer the best hope for common users of laptop/computer to identify the problems, take necessary steps to minimize computer related physical problems, reduce the cost and injuries associated with ergonomics hazards of computer usages.

Statement of Problem

The present research study aims to assess the extent of selected Physical problems viz musculoskeletal discomfort, posture related problem and vision problem faced by youth due to usage of Laptop/Computer**.**

Objectives of the Study

1. To study the demographic characteristics of the youth.
2. To determine the amount of time spent in a day by the youth on laptop/computer.
3. To know the reasons for usage of laptop/computer by the youth.
4. To assess the extent of selected physical problems viz musculoskeletal discomfort, vision problems and posture related problem faced by youth due to usage of laptop/computer.

Delimitation

1. The study was limited to youth who had been using laptop/computer during last twelve months from the time of data collection.
2. The study was limited to youth who had been in the age group of 15 to 24 years.
3. The study was limited to youth who had not been differently abled.

Hypotheses of the study

1. There exists a relationship between selected physical problems faced by youth due to usage of laptop/computer and selected personal, family and situational variables.
2. There exists a relationship between the musculoskeletal discomfort faced by the youth during last 12 months and posture related problems.
3. There exists a relationship between the vision problems faced by youth during last 12 months and posture related problems.

Review of Literature

CHAPTER – II

REVIEW OF LITERATURE

A review of literature is a condensed version of an exhaustive literature survey (Kamath and Udipi, 2010). In order to be aware with the subject matter concerned with the present research problem, a literature was undertaken. The main aim of the present research is to assess the extent of selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer. The major areas of related literature, scholarly articles, books and sources relevant to a problem, area of research, or theory, providing a description, summary and critical evolution of each work are presented here. presented here. To make review clear and understanding, the present chapter is divided into following section:

2.1 Theoretical Orientation

2.1.1 Youth: Definition and meaning

2.1.2 Amount of time spent in a day by the youth on laptop/computer and Reasons for usage of laptop/computer by the youth

2.1.3 Physical Problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by the youth due usage of laptop/computer

2.2 Related Researches

2.2.1 Researches conducted in India

2.2.2 Researches conducted in Abroad

Conclusion

2.1 Theoretical orientation

2.1.1 Youth: Definition and Meaning

Youth is the time of life when one is young, and often means the time between childhood and adulthood (maturity). It is also defined as “the appearance, freshness, vigor, and spirit etc., characteristic of one who is young”. Around the world, the English terms youth, adolescent, teenager, kid and young person are interchanged, often meaning the same thing. But they are occasionally differentiated. Youth can be referred to as the time of life when one is young. This involves childhood, and the time of life, which is neither childhood nor adulthood, but rather somewhere in between.[31]

The United Nation defines youth as persons between the ages of 15 and 24 with all UN statistics based on this range the UN states educations as a source for these statistics. The UN also recognizes that this varies without prejudice to other age group listed by member states such as 18-30. The UN also states they are aware that several definitions exist for youth within UN entities such as Youth Habitat between 15-32 years and African youth charter between 15-35 years. “This world demands the qualities of youth: not a time of life but a state of mind, a temper of the will, a quality of imagination, a predominance of courage over timidity, of the appetite for adventure over the life of ease”. [31] Youth is the stage of constructing the self-concept. The self-concept of youth is influenced by variables such as peers, lifestyle, gender and culture (Thomas, 2003). It is a time of a person’s life when their choice is most likely to affect their future.[31]

In much of sub-Saharan Africa, the term “youth” is associated with young men from 15 to 35 years of age. Youth in Nigeria includes all members of the Federal Republic of Nigeria aged 15-35. In Brazil, the term youth refers to people of both sexes from 15 to 29 years old. This age bracket reflects the influence on Brazilian law of international organizations like the World Health Organization (WHO) (Dalsgaard et al., 2008). The intergovernmental organization for Economic Co-operation “those between 15 and 29 years of age”.[31]

2.1.2 Amount of time spent in a day by the youth on laptop/computer and Reasons for usage of laptop/computer by the youth

The usage of laptop/computer internet and social media has been the important part of one's life from shopping to electronic mails, education and business tool. It plays a vital role in transforming people's lifestyle includes social networking sites and blogs where people can easily connect with each other. This become a day to day routine for the people, mainly defined as "the many relatively inexpensive and widely accessible electronic tools that facilitates anyone to publish and access information, collaborate on a common effort, or build relationship" (Siddiqui and Singh, 2016).

The internet has become an inalienable segment of our daily lives. Internet access and usage in the world has been proliferating year by year. Such a rapid growth has been interacted with people's needs and motivations. Information, communication, entertainment, study and office work have been prominent motives behind the internet use. It has also opened a gulf of opportunity to the professional and social lives (Bohra, 2020). Digital technology and social media are main component that attracts the youth for doing various things on laptop/computer.

The study on patterns of internet usage among youths in India reveals that an alarming majority of the youth spends more than 5 hours daily online. Youth in India are using internet for several activities and these activities are also changing with the higher penetration of the internet in semi urban and rural areas. The age group between 18 years to 25 years of the 5% of youth out off 100% was spent 1-2hrs in a day, 16% of youth was spent 2-3hrs in a day, 26% of youth spent 3-5hrs in a day, 20% of youth was spent 5-6hrs in a day and 30% of youth spent more than 6hrs in a day in semi urban and rural areas of India. Most of the respondents use internet for social media related activity; followed by academic assignments and watching recreational contents, playing game was their primary activity on the internet while using laptop/computer (Bohra, 2020).

For the purpose of education laptop/computer has been used as an innovative way. It has increased the quality and rate of collaboration for students. With the help of social media on laptop/computer students can easily communicate or share information quickly with each other's. It is also important for students to do practical work instead of doing paperwork. They can write blogs for teachers as well as for themselves to enhance their knowledge skills. It also conducts an online examination which play an important role to enhance the students' knowledge. Laptop/computer usage gives a way to students effectively reach each other regarding class ventures, bunch assignments or for help homework assignment, two see about class activities, school events, homework assignments. (Siddiqui and Singh, 2016).

The two main traditional reasons for using internet from the point of view of communication on laptop/computer is Mailing and Surfing. In India alternating reactions for internet usage were downloading internet content, purchasing online goods, studding and reading e-books (Siddiqui and Singh, 2016).

For office work usage of laptop/computer in marketing that includes business, organizations and brands which helps to create news, make friends, make connections and make follower on social media. Laptop/computer usage through social media is also enhance organization's performance in various ways such accomplish business objectives, increasing annual sales of organization. It has provided the benefit as a communication platform that facilitates two-way communication between a company and their stockholders. Through the usage of laptop/computer business can be promoted with the help of various social networking sites, by giving advertisement on the social media in order to attract maximum users or customers. Customers can connect and interact with business on a more personal level by using social media on laptop/computer. If organization has established a brand, it may help this organization to develop the existing brand and give the business a voice for make their strategy to promote their organization (Siddiqui and Singh, 2016).

Younger adults are leading the way in increased mobility, preferring laptops to desktops and using their cell phones for a variety of functions, including internet, email, music, games, and video (Zickuhr, 2011).

Youngers are using laptops for many reasons including schoolwork, zoom meetings for academic classes as well as extracurricular activities, communication with friends and family, and gaming to (Nulsen, 2021).

Youth still engage in a variety of activities online that cross the spectrum, from information seeking to communicative and creative endeavors. While content creation is an important and growing online activity, the two most popular internet activities among youth are information gathering rather than communicating. While entertainment information seeking is the most popular internet activity in this survey (81%), the percentage of online youth who use the internet to get news or information about current events also remains high (76% in 2004 vs 77% in 2006) (Lenhart et al., 2007).

2.1.3 Problem faced by youth using computer/laptop:

Computer-included health problems can be an umbrella term for the various problem's computer users can develop from extended and incorrect computer use. A computer user may experience, May physical Health problems from using computers extensively over a prolonged period in an inefficient manner. The computer use may have poor etiquette when using peripherals, for example incorrect posture. [33]

Problems faced by incorrect computer use are musculoskeletal discomfort, vision problems and posture related problems.

Musculoskeletal discomfort

Musculoskeletal conditions comprise more than 150 conditions that affect the locomotor system of individuals. They range from those that arise suddenly and are short-lived, such as fractures, sprains and strain, to lifelong conditions associated with ongoing functioning limitations and disability. Musculoskeletal

discomfort is typically characterized by pain (often persistent pain) and limitations in mobility, dexterity and overall level of functioning, reducing people's ability to work. Musculoskeletal conditions that affect, joints, bones (associated with fragility fractures), muscles, the spine (such as back and neck pain) and multiple body areas or systems.[32]

According to the National Institute for Occupational safety and Health, musculoskeletal disorder (MSD) is a damage that affects the musculoskeletal system of the human body, especially at bones, spinal discs, tendons, joints, ligaments, cartilage, nerves, and blood vessels. Such injuries may result due to repetitive motions, forces, and vibrations on human bodies during executing certain activities. Musculoskeletal discomfort can be related to the work activities and conditions, and they could significantly contribute to the development of Musculoskeletal Disorders. The World Health Organization recognizes conditions that result in pain and functional impairment that affect the neck, shoulders, elbows, forearms, wrists, and hands as work related when the work activities and work conditions significantly contribute to the development of work-related disorders. Work-related musculoskeletal disorders (WRMSDs) are described as wide range of degenerative and inflammatory conditions that affect the supporting blood vessels, peripheral nerves, joints, ligaments, tendons, and muscles. Such conditions could result in functional impairment and pain which are widely experienced at the upper extremities and the neck. (Korhan and Menon, 2019).

Excessively stretching a **muscle** can lead to astrain. A strain is an injury to a tendon or muscle resulting in swelling and pain. A sprain results from ligament fibers becoming strongly stretched, pulled from the bone, or torn apart. A sprain can stem from either a single injury or repetitive activities producing a cumulative impact. Ligaments that are commonly injured are found in the joint's areas such as the knee, ankle, and wrist areas. They can take weeks, or sometimes even months, to completely heal due to their diminished blood supply. A ligament

sprain can result in joint instability and can increase the risk of further injury (Bush, 2012).

According to Borhany et al. (2018), musculoskeletal problems with duration of computer use was significantly higher in computer and internet users. The duration of working with a computer was found as a significant factor for shoulder pain (Kaliniene et al., 2016). The prevalence of musculoskeletal symptoms in the neck and hand/wrist was significantly higher in the students of the fourth-year course (Lorusso et al., 2009).

According to Sabeen et al., (2013), strong association was found between neck pain and prolonged computer use. Low back pain was the major work-related musculoskeletal disorder found among the IT Professionals. More than 50% of them reported low back pain, neck, shoulder, upper back and wrist pain was the next most frequent types of musculoskeletal disorders (Hameed, 2013). It was found that women had overall (shoulder, wrist, hand, elbow, upper arm and lower arm) higher prevalence and significantly higher prevalence of upper limb complaints than men (Mohan et al., 2019).

Vision Problems

The American Optometric Association defines Computer vision syndrome (CVS) as “a complex of eye and vision problems related to activities, which stress the near vision and which are experienced in relation or during the use of computer” (Barar et. al., 2007). It is usually due to focusing of eyes on a computer or other display device for protected, uninterrupted periods of time and the eye muscles being unable to recover from the strain due to lack of adequate sleep. Symptoms of CVS include leachate, blurred vision, eye fatigue, strain to eye, neck pain, dry eyes, difficulty in refocusing the eyes. It is reported that around 60 million people suffer from CVS globally, and that a million occur each year. CVS affects 75% of the people who work on computers, most markedly among those who work for more than 3 to 4 hours on computers. This includes all professions that use computers (Information Technology, Business Process Outsourcing, Accounting,

Banking, Front Office) and Students who – work at the computer for more than 3hours a day, have strain at computer work, experience any or all of the key symptoms of CVS stated, experience stressful situations associated with work. (Pulla et al., 2018).

Computer vision syndrome, also known as digital eye strain or computer eye strain, is a condition that can cause specific vision and eye problems, such as eye strain, eye fatigue, headache, blurry vision, double vision, dry eyes, itch, red or tearing eyes, neck pain, shoulder pain.[40] Regular use of laptop/computer can lead to eye strain and discomfort. Blurred vision, double vision, dry, red eyes, eye irritation, headaches, neck or back pain caused due to laptop/computer usage.[41]

Staring at a bright, lit screen means rate of blinking decreases. This causes **dry eyes** which causes symptoms like **redness** and **soreness** of **eyes**. Prolonged staring for near vision results in convergence spasm of the small eye muscle since the eyes are not geared for prolonged near work. This causes **headaches** and inability to focus.[39]

Blink far less frequently when using a laptop/computer, causes the eyes to dry out and blur vision periodically while working.[41] The lack of definition of the letters on the screen, the reduced level of contrast, and the reflections on the glass all make viewing more difficult. Poor posture, bad lighting, viewing distance and screen resolution causes the blurriness.[42]

Dry eyes, a burning sensation, problems focusing these are symptoms of eye strain that all device users commonly face. A lot of headaches are caused due to much screen-time can bring. A combination of muscle tension at the base of the skull and an assault on the eyes in the usual cause, as well as stress.[37]

Posture Related Problems

The carriage of the body, the attitude of the body, or the position of the limbs (the arms and legs). The root of the word “posture” is the Latin verb “ponere” meaning

“to put or place”.[35] Posture is defined as the attitude assumed by the body either with support during muscular activity, or as a result of the coordinated action performed by a group of muscles working to maintain the stability. There are two types of posture. Dynamic posture is how person hold their self when moving, like walking, running or bending over pick up something. It is usually required to form an efficient basis for movement. Static posture is how person hold their self when they are not moving, like sitting, standing, or sleeping. Body segments are aligned and maintained in fixed positions. This is usually achieved by co-ordination and interaction of various muscle groups which are working statically to counteract gravity and other forces.[34]

In order to assess **good posture** position of the spine is very important. The spine has three natural curves at neck, mid/upper back, and lower back. Correct posture should maintain these curves, but not increase them. Head should be above the shoulder, and the top of shoulder be over the hips. In an ideal posture, the line of gravity should pass through specific points of the body. This can be observed or evaluated using plumb line to assess the midline of the body. This line should pass through the lobe of the ear, the shoulder joint, the hip joint, through the greater trochanter of the femur, then slightly anterior to the midline of the knees joint and lastly anterior to the lateral malleolus. When viewed from either the front or the back, the vertical line passing should theoretically bisect the body into two equal halves, with the bodyweight distributed evenly between the two feet.[34]

Proper posture of the body includes the following points:

- The ears should be aligned with the shoulders and the shoulders aligned with hips.
- The shoulder should be relaxed, and elbows are close to the sides of the body.
- The angle of the elbows, hips and knees is approximately 90 degrees.
- The feet flat on the floor.

- The forearms are parallel to the floor with wrists straight.
- Feet should rest comfortably on a surface.[34]

Office workers, freelancers, and students spend most of their days in front of a computer. According to a study conducted by researchers at Boston University,50% of university students said they experience neck and back pains. In most cases, being hunched over a computer is to blame.[36]

The human body is not designed to sit for long period of time. The seated position is one completely invented by modern human beings. Most of our time is spent indoors and most of the work one does require much less physical labor. The Cornell University Department of Ergonomics explains that up to 90% more pressure is put on ones back when one is seated compared to when one is standing. Sitting for prolonged periods of time can lead to back problems but paired with bad posture can lead irreversible spine damage. The stress builds up can eventually lead to anatomical changes in spine that can cause severe pain due to constriction of nerves and blood vessels. The pain can concentrate on the neck and back, and could also radiate into the extremities, which can cause discomfort even to the legs and arms.[36]

There are some bad postures that we adopted in our daily life while using laptop/computer that we can simply avoid:

- Looking down at screen, or desk, and head tips forward.
- Shoulders are rolled forward.
- Leaning forward from lower back.
- Elbows are too far away from body.
- Seated for too long (should be standing for 15-30 minutes per hour).[36]

Keeping screen too low, this will cause head to point down causing neck and backaches. Laptops are not designed for prolonged use because the screen and the keyboard are too close together that they can’t in good positions at the same time, using not separated keyboard and mouse can’t rest elbows while using

laptops.[36] Using a mouse for long periods of time causes to sit in a twisted position and overload one side of body, which is a major cause of back and shoulder problems".[38]

An uncomfortable seat, a set up with poor ergonomics, sitting too long or slouching lazily-these all contribute to the problem. Laptop Computers can aggravate things because the monitor and keyboard are so close. Pain in wrists-this classic overuse injury shows up as pain, stiffness or swelling in the fingers and wrist. Too much time on device it stresses the body. Being still for long periods reduces blood circulation and can put stress on muscles and joints.[37]

2.2 Related Research

2.2.1 Researches conducted in India

Talwar et al. (2009) carried out a study of "Visual and musculoskeletal Health disorders among computer professionals in NCR Delhi". The objective was to study the prevalence of health disorders among computer professionals and its association with working environment conditions. Cross sectional study design was selected, and 200 computer professionals' respondents was taken, from Delhi and NCR which included software developers, call center workers, and data entry workers. The findings revealed that 152 subjects had prevalence of visual problems in the study group and 153 subjects reported musculoskeletal problems. It was found that there was a gradual increase in visual complaints as the number of hours spent for working on computers daily increased and the same relation was found to be true for musculoskeletal problems. Visual problems were less in persons using antiglare screen and those with adequate lighting in the room. Musculoskeletal problems were found to be significantly lesser among those using cushioned chairs and soft keyboard.

A cross sectional study was conducted by **Saleem et al. (2015)** on "Work related musculoskeletal disorders among software professionals". The objective of the study was to determine the prevalence and pattern of musculoskeletal disorder (MSD) among software professionals and to evaluate the association between socio-demographic factors, computer work related factors and MSD. The Samples was selected for the survey with the non-probabilistic purposive sampling method from IT Companies in Chennai, Tamilnadu. A sample of 500 respondents (both male and female) software professionals was taken and Nordic MSD Questionnaire was selected for survey. The findings of the study revealed that majority of respondents had prevalence of work related MSD more during last 12months, based on their body region which was neck(29.56%), lover back (22.89%), shoulder (12.17%) and knees (9.56%) which was Statistically Significant Hence on appropriate prevention strategy needs to be carried out in order to enable them work comfortably.

Moom et al. (2015) carried out a study on "Prevalence of musculoskeletal disorder among computer bank office employees in Punjab (India)". The objective of the study was to examine the prevalence of musculoskeletal disorder among computer user bank office employees. A self-designed questionnaire based on Nordic musculoskeletal disorder was delivered to 60 computer users' employees of state bank of India district Nawanshahr Punjab. The study showed a high prevalence of disorders in the low- back, upper back neck, hand/wrist, shoulder etc. It was recommended that proper work posture; healthy working conditions must be provided which can make the work easier and more relaxed.

Gautam and Chako (2017) carried out study on "Impact of laptop usage on symptoms leading to musculoskeletal disorders". The study was conducted to evaluate the postures and identify the prevalence of musculoskeletal symptoms in girls using laptops for which 100college going female students between 18-25 years age group were selected through random sampling technique from various colleges of Allahabad city. A self-structured questionnaire was used to assess the laptop usage among adolescents and Rapid Upper Limb Assessment (RULA) was used to assess the posture of student while working with laptop. Standardized Nordic Musculoskeletal Questionnaire (SMSQ) was used to assess the nature and severity of self-rated musculoskeletal symptoms. The musculoskeletal symptoms were prominent in various anatomic regions like Neck, Shoulder, Upper back and Lower back, respectively.

Mallik et al. (2017) carried out a study on "Prevalence of dry eye amongst computer workers in Kanpur" to find out the factors relating to eye and vision problems associated with computer work and recommendations for preventing or reducing their developments. It was a cross-sectional study, 214 employees of Rama University, Madhana, Kanpur's respondents were taken, and semi-structured questionnaire was used to collect the data. The finding revealed that 214 personals interviewed from majority of 118 respondents spent 3-6 hours/day and common symptoms reported more affected as watery eyes. The ergonomics of the working environment of the computer professionals had a direct impact on

their wellbeing and the organization employing them, as well as the professionals themselves need to be sensitized regarding the importance of the regular eye & health check-up and proper working conditions.

Mahadik et al. (2017) conducted a study on “prevalence and statistical analysis of musculoskeletal disorders among academicians from Higher education”. Cross sectional study was conducted from Government Kamal Raja Girls College, Gwalior and 100 teaches of Govt. kamla Raja Girls college was taken as respondents from a random group valid for the study. Data was collected using a Nordic based Questionnaire which was modified as per the requirement of the study. Statistical analysis survey forms found that most of the subjects was in overweight category and affected with pain in more than two joints. The most affected joints found was neck and lower back, and it was found that among professionals the main factor was continuous or long term standing during theory and practical classes, long term use of computer for academic and research purposes contributing to it.

Sudharshini et al. (2018) conducted a study on “Computer Professionals and Their Health Issues and Managements”. The objectives of study was intended to explore the knowledge of health problems pertaining to exposure of computer work and their management among the computer professionals working in Chennai. Convenience Sampling was adopted and implement to collect data from 300 study subjects working in IT Companies in Chennai, Tamilnadu, South India. The findings revealed that 71% of the subjects faced one or many problems like head ache, dry eyes, back ache, low back pain over three-fourth of the study subjects had suffered one or more health problems due to the invariable use of computers in their day-to-day work places and nearly half of them had on average knowledge on health issues. These problems need to be addressed through application of measures.

Bist and Bakhshi (2018) conducted a study on “Knowledge of computer ergonomics and incidence of musculoskeletal disorders among students of Punjab Agricultural University, Ludhiana, India” which was undertake to study

Computer/Laptop use pattern and knowledge of related ergonomic practices among students of Punjab Agricultural University (PAU), Ludhiana, India and to assess the prevalence and magnitude of Computer/Laptop use related MSDs among students.120 students pursuing post-graduation was selected randomly from the four different disciplines namely college of Home Science of PAU. Results revealed that majority of the respondents was in the age group of 26-27 years was using Computer/Laptop for 3-4 years, for 3-4 hours daily and used to sit in bed while working on Computer/Laptop had some knowledge about the importance of work behavior while using it and felt pain in the neck(88.32%), low back (75.00%), mid back (73.33%) and upper back (72.50%). It was also found that while working overall bodily fatigue or tiredness, shoulder or back pain stiffness and headache during or after working on the computer were the majority symptoms reported.

Chako and Chetan (2018) conducted a study on "Awareness on computer ergonomics and prevention of MSD among the Millennials in Bangalore". The objectives of the study was to explore students awareness on ergonomics and its practice whilst using a computer, to understand and analyze the various factors of ergonomics at work station , to identify students health risks of using computer workstations, and to examine if ergonomics factors had an impact on student productivity. An exploratory research was conducted, and sample was selected through stratified sampling from Bangalore and 67 undergraduate students from various colleges/Universities in Bangalore who use laptops/desktops for various purpose. A structured questionnaire and personal interview were used to collect data from the respondents. This study has clearly demonstrated that students, the majority of whom was under 24 years old, experience pain or discomfort whilst using their computer.

Shaikh (2020) conducted a study on "impact of work from home in covid-19: a survey on musculoskeletal problems in IT Professionals". The aim of this study was to find common musculoskeletal problems faced by computer professionals while doing work from home in lockdown. Descriptive analysis and google form

were selected in questions about current and previous musculoskeletal problems working conditions and way to tackle these problems circulated to computer professionals doing work from home. The findings revealed that percentage of shoulder pain/trapeziums pain, elbow pain, wrist pain increased by double with significant increase in percentage of headache, eye strains and back pain in this period. Inappropriate posture despite having good works stations, disturbance while working at home and increased working hours seems to be the reason for this increase in problems.

2.2.2 Researches conducted Abroad

Oha et al. (2014) carried out a study on “Individual and work-related risk factors for musculoskeletal pain: a cross-sectional study among Estonian computer users”. The aim of this study was to assess the prevalence of musculoskeletal pain (MPS) by anatomical region during the past 12 months and to investigate its association with personal characteristics and work-related risk factors among Estonian Office workers using computers. A cross sectional survey was conducted, the questionnaires were sent to the 415 computer users. Data were collected by self-administered questionnaire from 202 computer users at two universities in Estonia. The questions compared about MSP at different anatomical sites, and potential individual and work-related risk factors. Associations with risk factors were assessed by logistic regression. A high prevalence of MSP in the neck, low back, wrist/arm and shoulder was observed among Estonian computer users. Psychosocial risk factors were broadly consistent with those reported from elsewhere.

Hassan et al. (2015) carried out a study on “Frequency of computer vision syndrome & Ergonomic practices among computer Engineering students”. The aim of the study was to assess the frequency of CVS & related ergonomic practices among computer engineering students. A cross sectional study was conducted among computer engineering students of Superior University, Lahore, Pakistan. The objectives of this research were to determine the frequency of computer vision syndrome and to determine the ergonomic practices of computer use by the computer engineering students. A self-administrated questionnaire to assess computer vision syndrome was used. Simple randomized sampling technique and 170 sample from computer engineering’s students were taken as respondent. The findings revealed that majority of respondents was male and average duration of computer use was 2-5 hours, by 109 subjects and 78 subjects was using computers more than 50 hours a week. 119 subjects reported forward learning posture to clearly see characters on the screen situation and regarding the back posture 28 subjects were employing good posture. This study

conclude that computer vision syndrome was a highly frequent condition and self- reported ergonomic analysis of computer use revealed that majority of the students was not practicing the correct ergonomic principles.

Hussain et al. (2015) conducted a study on “Awareness of good posture and computer ergonomics among medical students of ISRA University”. The objective of the study was to evaluate the awareness of good working posture and computer ergonomics among medical students of ISRA University, Hyderabad. A cross sectional study has done on 100 medical students of ISRA University Hyderabad. Study was convenient and self-structured questionnaire was used for data collection. Data analysis was done by using statistical package for social sciences (SPSS) 14 version. It was found that majority of students claimed to be aware of good posture, but their answers has shown that there was lack of knowledge regarding good posture.

Ardhan et al. (2016) carried out a study on “Analyzing musculoskeletal system discomforts and risk factors in computer using office workers.” The objective of this research was to analyze the prevalence of work-related computer-user musculoskeletal discomforts, personal and computer-related risk factors. A cross-sectional survey was conducted, and 395 samples of office workers were taken as respondents from manias Turkey. Musculoskeletal symptoms and risk factors were evaluated for participant’s demographics and job attributes on the 21-item questionnaire and the Turkish-Cornell musculoskeletal Discomfort Questionnaire. The findings revealed that musculoskeletal discomfort risks were being male, increasing daily computer usage, feeling computer usage discomfort, hours working at desk and having knowledge about ergonomic exercises. This study concluded that musculoskeletal symptoms was common in Turkish office workers and indicated the need for more attention to musculoskeletal disorders and designing effective preventive interventions.

Amin et al. (2016) carried out a study on “The prevalence of computer Related Musculoskeletal disorders Among Bankers of Dhaka city”. The objective of this study was to find out (a) the prevalence of musculoskeletal disorders and (b) the

association between musculoskeletal pain and computer use. The descriptive type of cross-sectional study was conducted to see the pattern of musculoskeletal disorders among the computer users of three selected banks of Dhaka city with a sample of 400 respondents. It was revealed that a high proportion of Bangladeshi computer users among bankers reported musculoskeletal disorders at some body site in their occupational lives with the neck and back being injured most often. Education program on prevention and coping strategies for musculoskeletal disorders was recommended for computer users in order to reduce the rate of occupational hazards.

Dolen and Elias (2016) carried out a study on "Knowledge and practice of laptop ergonomics and prevalence of musculoskeletal symptoms among university students". The objective of the study aimed to assess the knowledge and practice of laptop ergonomics and prevalence of musculoskeletal symptoms among university students. The cross-sectional study was conducted on 197 volunteers from a public university student in Selangor. Questionnaire was the main tool for data collection. Volunteers were 101 health science and 96 non-science students who completed a self-administrative questionnaire consisting of general information, knowledge and practice of laptop ergonomics and self-reported musculoskeletal symptoms. There was no association found between knowledge, practice and other contributing factors with MSS, the prevalence of musculoskeletal symptoms among UPM students was 67%. Hence, this study emphasized the need to promote ergonomics awareness program on musculoskeletal pain and healthy postures while using laptop in order to minimize the prevalence of musculoskeletal symptoms among the students.

A study on "Prevalence of musculoskeletal disorders among schoolteachers from urban and rural areas in Chuquisaca, Bolivia: a cross-sectional study" was conducted by **Soto et al. (2017).** On a sample of 1062 randomly selected schools. The data was collected through questionnaire. It was found that prevalence of MSD in any part of the body was 86% during the last 12 months, 63% during the last 7 days and 15% for work limiting pain MSD was most

common in the neck(12-months prevalence 47%) and least common in the wrist /hands (26%). It is needed to identify risk factors for MSD in teachers in order to propose appropriate strategies to control and reduce it.

A study on “Computer vision syndrome and Associated Factors among computer users in Debre Tabor Town, Northwest Ethiopia “was conducted by **Dessie et al. (2018).** On a sample of 652 multistage random sampling methods was applied to participants who worked in government institutions in Debra town. The data was collected through structured questionnaire. Computer vision syndrome was measured by self-reported method. Bivariate and Multivariable binary logistic regression analysis was performed using SPSS version 20. It was found that the prevalence of CVS was 422(69.5%) with 95% CI of 65.60%, 73.0%. Blurred vision, eye strain and eye irritation were the commonest reported symptoms of CVS with proportion of 62.60% ,47.63% and 47.40%, respectively office (adjust odds ratio (ARO)=4.74) and secretary (ARO=9.17). Daily computer usage (ARO:2.29), and preexisting eye disease (ARO=3.19) was risk factors for CVS. Computer users with high payments who took regular health break, and with good knowledge on computer safety measures was less impacted safety measures were less impacted. It was revealed that monthly income, occupation, daily computer usage, regular health break, knowledge and preexisting eye disease were predictor variables for CVS. Optimizing exposure time, improving awareness on safety measures and management support was important to tackle Computer Vision Syndrome.

Sirajudeen et al. (2018) carried out study on “Work-related musculoskeletal disorders among faculty members of college of Applied medical Sciences, Majmaah University, Saudi Arabia”. The objective of this study was to determine the prevalence and factors associated with WMSDs among the college of Applied Medical Sciences (CAMS), on a sample of 60 Majmaah University faculty members. The data was collected through questionnaire. It was found that the prevalence of WMRDs in anybody region among faculty members in this study was 55%. The neck complaint was the most prevalent WMSDs 53.5% followed

by lower back 43.3% and hand regions 31.6%. Computer use and lack of ergonomic training was associated with WMSDs in most of the body regions. More than half of the study participants were affected with WMSDs. The findings of this study emphasize the essentiality of ergonomics training members.

James et al. (2018) conducted a study on "Musculoskeletal discomfort and use of computers in the university environment". A cross-sectional study design was used to survey University of Newcastle employees regarding the prevalence of musculoskeletal discomfort, workstation, work postures, and ergonomic training. In this study, workstation refers to any environment or equipment in which university staff was using a computer, laptop or tablet device. The findings indicate that musculoskeletal discomfort was prevalent in workers in the university setting and this was associated with working postures.

A study on "Musculoskeletal problems in frequent computer and internet users" was conducted by **Borhany et al. (2018).** The aim of this study was to see the frequency of musculoskeletal problems in frequent computer and internet users. A descriptive cross-sectional study was conducted on a sample of 150 office workers and students using computer and internet for not less than 3 hours per day In Pakistan, who were in the age group of 18 to 50 years. It was concluded that musculoskeletal symptoms were quite common, headache and back pain being most common symptoms. These symptoms were associated with prolonged use of computer and internet and often left unreported and unrelated.

Özdinc et al. (2019) carried out a study on "Musculoskeletal problems in academicians related to factors in Turkey." The purpose of this study was to investigate the musculoskeletal problems distribution and related factors among academicians. On a sample of 142 academicians. This study was performed by using a personal and professional information questionnaire, the extended Nordic Musculoskeletal Questionnaire and international physical Activity Questionnaire Short Form. It was found that Neck and Lower back pain were mostly seen in academicians and their incidence was equal (63.4%). The study revealed that

the most common musculoskeletal problems reported by academicians were in the upper back and neck regions, which have level physical activity.

Heidari et al. (2019) conducted a study on “Ergonomic posture analysis of different postures in laptop users at non-official places and related musculoskeletal disorders by rapid upper limb assessment method”. The study aimed to assess the different postures laptop users, especially in non-official places, and its effect on musculoskeletal disorders (MSDs). This was a cross-sectional study. One hundred and fifty university students were chosen that had continuously used laptop for 5 years. Data was gathered by questionnaire and posture analysis was done using Rapid Upper Limb Assessment method. It was found that neck, upper and lower back, shoulder and wrist were organs that influence more by laptop based on body configuration.

Abudawood et al. (2020) conducted a study on “Computer vision syndrome among university medical students in King Abdulaziz University, Jeddah, Saudi Arabia”. The aim of this study was to determine the prevalence of CVS, associated risk factors, and commonly associated symptoms and to assess the awareness and proper practice of using computers for studying. A cross-sectional descriptive study was conducted among 651 undergraduate medical students in King Abdulaziz University, Jeddah, Saudi Arabia. An electronic survey was conducted to collect the data. Most frequently symptoms reported were excessive tearing and neck, shoulder or back pain.

Conclusion

The review of literature focused on introduction of youth, amount of time spent in a day by the youth on laptop/computer and reasons for usage of laptop/computer by the youth and physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by the youth due usage of laptop/computer. The related researches conducted in India focused on prevalence and pattern of work-related musculoskeletal disorders (MSD) among software professionals, prevalence of musculoskeletal disorders among computer bank employees, among academicians from higher education, impact of laptop usage on symptoms leading to musculoskeletal disorders in female students, Prevalence of dry eye amongst computer workers, computer professionals and their health issues and managements, knowledge of computer ergonomics and incidence of musculoskeletal disorders among students, awareness on computer ergonomics and prevention of MSD among the millennials, visual and musculoskeletal health disorders among computer professionals, musculoskeletal problems in IT professionals.

The studies related to the research topic conducted abroad focused on musculoskeletal pain among computer users, computer vision syndrome and ergonomics practices among computer engineering students, awareness of good posture and computer ergonomics among medical students, musculoskeletal system discomfort and risk factors in computer using office workers, prevalence of computer related musculoskeletal disorders among bankers, schoolteachers, academicians, knowledge & practice of laptop ergonomics and prevalence of musculoskeletal symptoms among students, computer vision syndrome and associated factors among computer users, among university medical students, work-related musculoskeletal disorders among faculty members, musculoskeletal discomfort and use of computers, musculoskeletal problems in frequent computer and internet users, ergonomic posture analysis of different postures in laptop users at non-official places and related musculoskeletal disorders. There were few studies conducted on selected physical problems viz. musculoskeletal

discomfort, vision problems and posture related problems in youth especially while using laptop/computer in their day to day routine. Therefore, the researcher was interested in carrying out an investigation on the topic undertaken.

Methodology

CHAPTER III

METHODOLOGY

Research methodology is a way to systematically solve the research problem or it may be understood as a science of studying how research is done scientifically (Kothari and Garg, 2019). The research design, variables under study, sample size and sampling procedure, tool for data collection and operational definitions of terms used in the study are explained briefly in this chapter. The present investigation was undertaken to gather information regarding the amount of time spent in a day by the youth on laptop/computer, reasons for usage of laptop/computer viz. study, communication, entertainment and office work and to assess the extent of selected physical problems viz. musculoskeletal discomfort (during last 12 months), vision problems (during last 12 months) and posture related problems faced by youth due to usage of laptop/computer. The present chapter focuses the methodological procedures carried in the research which are explicitly described under the following categories:

3.1 Research Design

3.2 Variables and Conceptual framework under study

3.3 Operational Definitions

3.4 Locale of Study

3.5 Unit of Inquiry

3.6 Sample Size and Sampling Procedure

3.7 Selection, Development and Description of the Tool

3.8 Data Collection

3.9 Data Analysis

3.1 Research Design:

According to Kothari and Garg (2019), a research design is an arrangement of condition for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure and is the conceptual structure within which research is conducted. It consists of specification of methods for inquiring the information needed. The research design for the present investigation used was descriptive in nature. Kothari and Garg (2019), “Descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual, or of a group”. Descriptive design was thought to be most appropriate method for the present study.

3.2 Variables and conceptual framework under study:

A concept which can take on different quantitative values is called a variable (Kothari and Garg, 2019). There were two sets of variables for the present study viz. Independent variables and Dependent variable (Fig.1).

3.2.1 Independent Variables of the respondents: The variables that is antecedent to the dependent variable it is termed as an independent variable (Kothari and Garg, 2019).

For the present study the independent variables were categorized under two sub heads:

- **Personal variables of the respondents:** Personal Variables of the respondents included Age (in years), Gender, Educational Qualification, and Employment Status.
- **Family variable of the respondents:** Family Variable of the respondents included Total monthly family income (in rupees).
- **Situational variables of the respondents:** Situational Variables of the respondents included Extent of usage of laptop/computer, Amount of time spent in a day by the youth on laptop/computer viz. spending time in a day

on the laptop/computer (in hours), frequency of usage of laptop/computer by the youth and Reasons for usage of laptop/computer by the youth viz. study, communication, entertainment and office work.

3.2.2 Dependent Variable of the respondents: A variable that depend upon or is a consequence of the other variable is termed as dependent variable (Kothari and Garg, 2019). For the present study the dependent variable was

- Extent of selected physical problems viz. musculoskeletal discomfort (during last 12 months), vision problems (during last 12 months) and posture related problems faced by the youth.

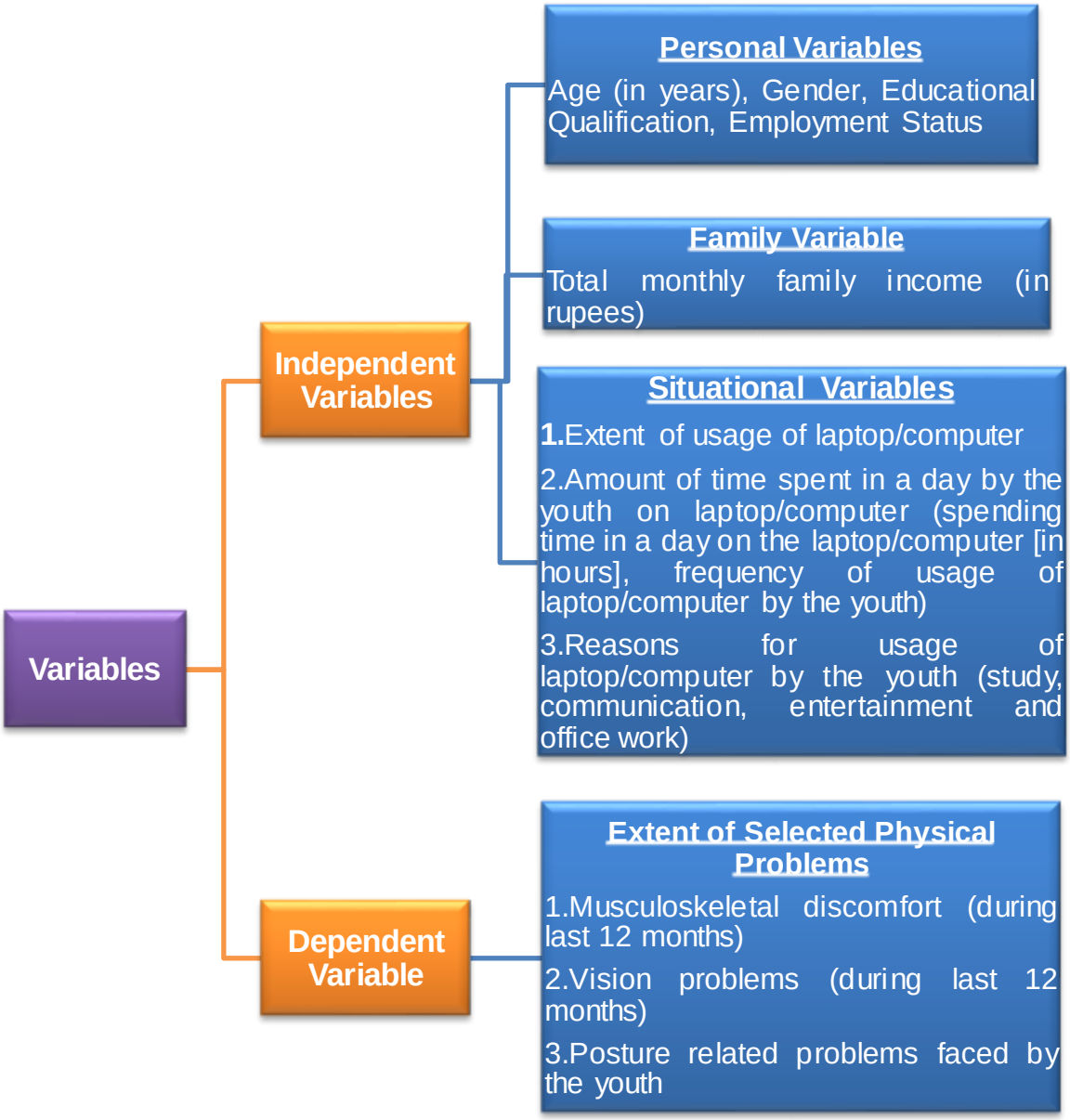

Figure 1: Variables under study

Hypothetical Relationship between Variables: A schematic diagram showing hypothetical relationship between selected variables with its explanation is presented below.

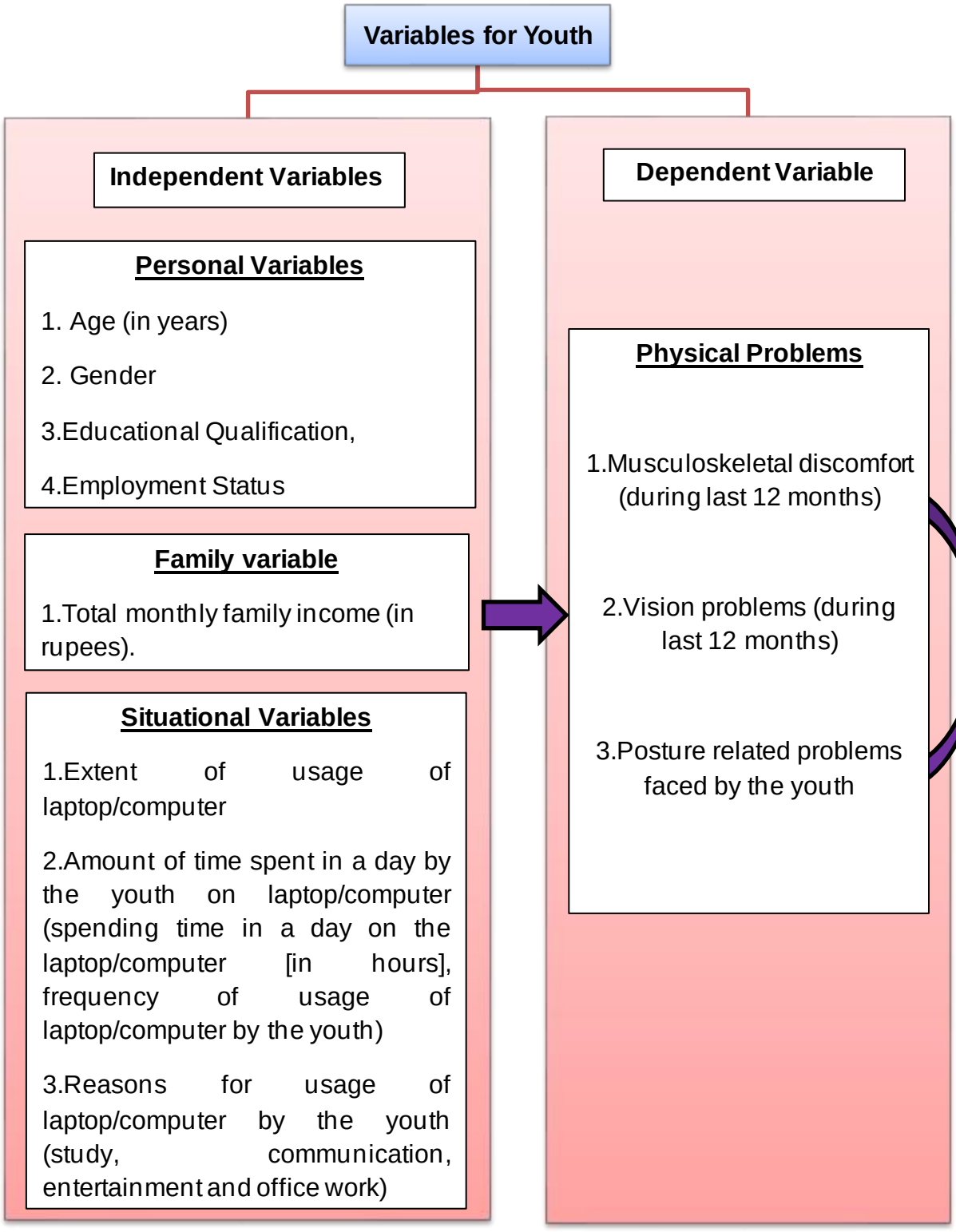

Figure 2: Schematic Framework to show Hypothetical Relationship among Variables under study

Explanation of Conceptual Framework

It was conceptualized that selected physical problems faced by youth viz. musculoskeletal discomfort (during last 12 months), vision problems (during last 12 months) and posture related problems faced by the youth were influenced by their personal variables such as age (in years), gender, educational qualification, and employment status, family variable such as total monthly family income (in rupees) and situational variables such as extent of usage of laptop/computer ,amount of time spent in a day by the youth on laptop/computer (spending time in a day on the laptop/computer [in hours]**,** frequency of usage of laptop/computer by the youth), reasons for usage of laptop/computer by the youth (study, communication, entertainment and office work). It was also conceptualized that the selected physical problems viz. musculoskeletal discomfort (during last 12 months) and vision problems (during last 12 months) were associated with posture related problems (Fig 2).

3.3 Operational Definitions

The terms used in present study were operationally defined as follow.

3.3.1 Youth: For the present study, youth was operationally defined as individuals who were in the age group of fifteen years to twenty-four years and have been using laptop/computer since last one year.

3.3.2 Laptop/ Computer: A laptop/computer is operationally defined as a machine that youth uses in their daily life for various reasons like, for the studying, for entertainment, for the office work and for the communication.

3.3.3 Amount of time spent in a day by the youth on laptop/computer: It was operationally defined as the time that youth spent in their daily life for using laptop/computer to do various activities.

3.3.4 Reasons for usage of Laptop/Computer by the youth: It was operationally defined as various reasons for usage of Laptop/Computer by the youth. like for study, communication, entertainment and office work.

3.3.5 Physical Problems: For the present study, it was operationally defined as extent to which youth faced physical problems viz. musculoskeletal discomfort, vision problems and posture related problems due to the usage of laptop/computer.

3.3.5.1 Musculoskeletal discomfort: It was operationally defined as the discomfort faced by the youth in their body parts such as neck, shoulder, upper back, elbows, wrists/hands, lower back, hips/thighs, knees, ankles/feet during last 7 days and 12 months respectively.

3.3.5.2 Vision Problems: In the present study vision problems was operationally defined as the problems that youth faced such as headache, tiredness, eyestrain, blurred vision, Double vision, red eyes, eye irritation, dry eyes, and back pain during last 7 days and 12 months respectively.

3.3.5.3 Posture related Problems: In the present study, posture related problems were operationally defined as the various postures (good as well as poor) adopted by the youth during laptop/computer usage.

3.4 Locale of Study

The locale of study was Vadodara city. Vadodara, formerly also known as Baroda, is the large city in the Indian state of Gujarat. The railway line NH8 that connect Delhi and Mumbai pass through Vadodara. The city is also known as Sanskari Nagari (The Cultural City) and Kala Nagari (the City of art) of India [29]. The sample was collected from Vadodara city.

3.5 Unit of Inquiry

The unit of inquiry was the youth who were in the age group from Fifteen years to Twenty-Four years.

3.6 Sample Size and Sampling Procedure

Convenience sampling technique was used to select sample for the present study. When population elements are selected for inclusion in the sample based

on the ease of access, it is called convenience sampling (Kothari and Garg, 2019). The permission was taken from the parents for the respondents who were below 18 years of age for the data collection. The data was collected from 120 respondents of Vadodara city who were using laptop/computer since last 12months.

3.7 Selection of the Tool

In the light of objectives framed for the present study, data collection tool namely Questionnaire (in the google form) was developed. The questionnaire was developed to find out the demographic characteristics, amount of time spent in a day by the youth on laptop/computer, reasons for usage of laptop/computer by the youth and extent of selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems experienced by the youth due to usage of computer/laptop.

3.7.1 Development of the Tool

Based on the information collected through review of literature, interaction with experts in the field, guidance of the experts, questionnaire was prepared, and care was taken to include questions that would attain objectives of the study completely.

3.7.2 Description of the Tool

The various sections of the tool (Fig 3) developed for the study was described in detail as follow:

Section 1: Background Information

This section contained questions regarding the personal information of the respondents covering details on their age (in year), gender, height (in cm), weight (in kg), educational qualification, employment status. Family Information of the respondents included details on their family type, number of family members, and total monthly family income (in rupees). Situational information of the respondents included detail on extent of usage of laptop/computer by the youth.

Section 2: Amount of time spent in a day by the youth on laptop/computer

This section contained questions regarding the amount of time spent in a day by the youth on laptop/computer

Section 3: Reasons for usage of laptop/computer by the youth

This section contained questions regarding the reasons given by the youth for using laptop/computer viz. study, communication, entertainment and office work. like for study (using an online dictionary or encyclopedia, searching online for information and learning about a topic interested in, learning about educational software, games and quizzes, using word excel, power point, attending online classes and webinar, participating in online learning programs, downloading uploading or brows learning material for school/college's related work and checking the school/college website for announcements, dates, circulares etc.), for communication (making new friends through social networking sites, taking part in online group discussions or forums, sending and reading emails, attending meetings), for Entertainment (reading or writing the news, searching online for practical information(e.g. Seats at a match, concert, movie, shopping, train, health) playing games, browsing the internet for fun (e.g. watching video clips, download music, using social media, going live), for office work (marketing products, data typing work, programming, attending meeting's, workshops and conferences, making online transactions related to work). The scale of reasons for using laptop/computer by the youth contained 22 items. The various statements that reflected scale It had 3 point continuum for the responses "To high extent", "To some extent" and "To low extent" which were scored 3 through 1 respectively. The minimum score for overall scale was 22 and maximum score was 66. High scores reflected high extent of reason for usage of laptop/computer by the youth and vice versa.

Section 4: Extent of selected physical problems faced by youth due to usage of laptop/computer

In this section, selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems were included.

Musculoskeletal Discomfort: Modified version of the standardized questionnaire namely" Nordic musculoskeletal Questionnaire" was used to study the musculoskeletal discomfort faced by the youth while using laptop/computer during last 12 months and 7 days respectively. The scale also consisted of statements regarding the discomforts that prevented them in carrying out normal activities during last 12 months. The response structure for each statement was in the form of Yes and No, wherein a score of 2 through 1 was given. The modified version of Nordic Musculoskeletal Questionnaire was developed from a project founded by the Nordic Council of Ministers. It was published in 1987 by Kourinka et.al, 1987 in "Standardized Nordic Questionnaire for the analysis of musculoskeletal symptoms".

Vision Problems: This part included items pertaining to the vision problems viz. headache, tiredness, eyestrain, blurred vision, Double vision, red eyes, eye irritation, dry eyes, back pain faced by the youth while using laptop/computer during last 7 days and 12 months respectively. The response structure for each statement was in the form of Yes and No, where in a score of 2 through 1 was given. For the scale of vision problems, back pain was undertaken as one of the vision problems from the study of Abudawood, Ashi and Almarzouki, 2020. "computer vision syndrome among undergraduate medical students in king abdulaziz university, jeddah, Saudi Arabia".

Posture related Problems: To study the posture related problems a scale comprising of 18 statements of various postures adopted during the usage of laptop/computer which were good posture as well as poor posture was prepared. The **good posture** viz. (not bending or thrusting forward, keeping hand placed in a straight line with lower arm, keeping spine in a correct position, taking frequent

stretch breaks every 30 to 40 minutes, keeping feet rest flat on the floor, keeping thighs in parallel to the floor, sitting with back support while operating laptop/computer) and **poor posture** viz. (sitting for long hours in one position, sitting with lifted shoulders for mor than 2 hours, sitting with awkward posture (back bended), performing repetitive tasks, keeping head in bended position, keeping head towards left and right, sitting on floor and using laptop/computer, seeing the screen at an awkward angle, bending wrist to use the keyboard, remaining in a static posture for long periods of time, tilting head, keeping feet rest flat on the floor, keeping thighs in parallel to the floor, sitting with back support while operating laptop/computer) were taken up for the present study. The total numbers of items for posture related problems were 18 and hence minimum score was 18 and maximum score was score was 54. The response structure was “To high extent”, “To some extent” and “To low extent” which were scored 3 through 1 respectively” Higher score reflected the adoption of posture to a high extent and vice versa.

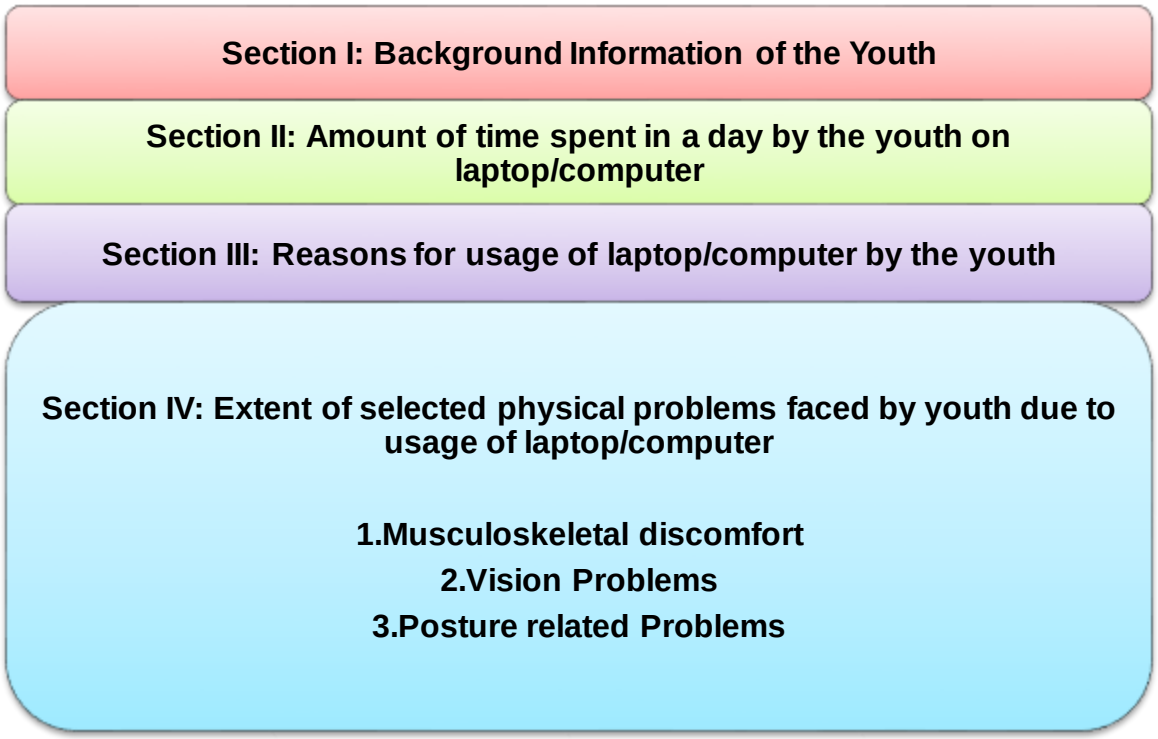

Figure 3: Description of tool

3.7.3 Establishment of content validity of scales

The scale prepared by researcher for the present study was given to the panel of eleven judges who were academicians from the Department of Family and Community Resource Management, Faculty of Family and Community Science, The Maharaja Sayajirao University of Baroda, Vadodara. They were requested to check the clarity and relevance of the content for each scale.

Establishment of Reliability

The reliability was established for the scale's reasons for usage of laptop/computer by the youth, vision problems and posture related problems through pretesting.

Pretesting: A pilot study was conducted to find out the feasibility and clarity of the scales developed. Therefore, the developed scales was pretested on 30 respondents who had similar characteristics as of those of final respondents of the study.

Reliability of the scale: The reliability of the scale was established through split-half method of establishing reliability. The Cronbach's alpha test had been applied on random of 30 samples. The formula of Cronbach's alpha is as below:

$$\alpha = \frac{k\bar{r}}{(1 + (k-1)\bar{r})}$$

Where, k is the number of components, $\bar{r}$ the mean of the $k(k-1)/2$ non-redundant correlation coefficients (Sun et al., 2007).

In order to get the overview of the scale used in the present study, the reliability value of each of the scale has been demonstrated below

Reliability Co-efficient of different scales

Table 1: Reliability Co-efficient of the scale for reasons for usage of laptop/computer by the youth

Sr. No.	Scale	Reliability Co-efficient
1.	Reasons for usage of laptop/computer by the youth	0.773

Table 2: Reliability Co-efficient of the scale for physical problems viz. vision problems and posture related problems faced by the youth due to usage of laptop/computer.

Sr. No.	Scale	Reliability Co-efficient
1.	**Physical Problems**	
	a. Vision Problems	0.946
	b. Posture Related Problems	0.820

3.8 Data Collection

The data were gathered by researcher between January 2021 to February 2021. The method utilized to collect the data was questionnaire method (Online Google form). The respondents while given the questionnaire through online google form were requested to go through it to resolve their doubts or misunderstanding if any immediately with the researcher. The rapport building with the respondents was built by informally discussing with them about the concept in general online. Thereafter, the respondents were oriented about the purpose of the research and the motive to gather the data. While collecting the online google form back from the respondents, the researcher ensured that it did not have any incomplete information. The data were collected only by those respondents who enthusiastically and willingly gave the needed information for the study.

3.9 Data Analysis

The procedure used to analyze the data was categorization, coding, tabulation and statistical analysis.

3.9.1 Categorization

The following categories was made to enable researcher to analyze the data for further statistical application.

i. **Age of respondents (in years):** It referred to the age of the respondents at the time of data collection. The obtained range of the age of the respondents on basis of equal intervals are as follows:
    1) 15-16 years
    2) 17-18 years
    3) 19-20 years
    4) 21-22 years
    5) 23-24 years

ii. **Gender:** It was categorized as follows:
    1) Male
    2) Female

iii. **Educational Qualification:** It referred to the education qualification of the respondents at the time of data collection was categorized as follows:
    1) 10^{th} Pass
    2) 12^{th} Pass
    3) Diploma
    4) Graduate
    5) Postgraduate

iv. **Employment Status:** It referred to employment status of the respondents at the time of data collection which was categorized as follows:
    1) Employed
    2) Unemployed
    3) Self-employed

v. **Height (in cms) of the respondents:** It referred to height (in cms) of the respondents at the time of data collection. The obtained range of the height of the respondents based on equal intervals are as follows:
    1) 74-117
    2) 118-161
    3) 162-205

vi. **Weight (in kg) of the respondents:** It referred to weight (in kg) of the respondents at the time of data collection. The obtained range of the height of the respondents based on equal intervals are as follows:
    1) 32-49
    2) 50-67
    3) 68-85

vii. **Type of family:** It was categorized as follows:
    1) Joint
    2) Nuclear

viii. **Number of family members:** It referred to number of family members of the respondents are as follows:
    1) Only 1 member
    2) 2-3 members
    3) 4-5 members
    4) 6-7 members
    5) 8 or more

ix. **Total monthly family income (in rupees):** It referred to total monthly family income (in rupees) of the respondents are as follows:
    1) ₹10,000 - ₹20,000
    2) ₹20,000 - ₹30,000
    3) ₹30,000 - ₹40,000
    4) ₹40,000 - ₹50,000
    5) More than ₹50,000

x. **Extent of usage of laptop/computer:** It referred to extent of usage of laptop/computer by the respondents which was categorized as follows:
   1) One year
   2) More than one year

Amount of time spent in a day by the youth on laptop/computer

xi. **Spending time in a day on the laptop/computer:** It referred to spending time in a day on laptop/computer by the respondents which was categorized as follows:
   1) Less than 60 minutes
   2) 1-2 hours
   3) 3-4 hours
   4) 5-6 hours
   5) More than 6 hours

xii. **Using laptop/computer more frequently in a day:** It referred to using laptop/computer more frequently in a day by the respondents which was categorized as follows:
   1) Morning
   2) Afternoon
   3) Evening
   4) Night

Reasons for usage of laptop/computer by the youth

xiii. **Main reasons of using laptop/computer:** It referred to main reasons of using laptop/computer by the respondents which was categorized as follows:
   1) Study
   2) Communication
   3) Entertainment
   4) Office work

xiv. **Reasons of using laptop/computer:** It referred to the different type of reasons of using laptop/computer by the respondents which was categorized as follows:

1) **Study**

   To Low Extent: 8-13

   To Some Extent: 14-19

   To High Extent: 20-24

2) **Communication**

   To Low Extent: 4-6

   To Some Extent: 7-9

   To High Extent: 10-12

3) **Entertainment**

   To Low Extent: 5-8

   To Some Extent: 9-12

   To High Extent: 13-15

4) **Office Work**

   To Low Extent: 5-8

   To Some Extent: 9-12

   To High Extent: 13-15

5) **Overall**

   To Low Extent: 22-36

   To Some Extent: 37-51

   To High Extent: 52-66

Extent of physical problems faced by youth due to usage of laptop/computer

xv. **Musculoskeletal Discomfort:** It referred to musculoskeletal discomfort faced by youth during last 7 days and 12 months, which was categorized as follows:

1) Yes
2) No

xvi. **Vision Problems:** It referred to the vision problems faced by youth due to usage of laptop/computer during last 7 days and 12 months, which was characterized as follows:

1) Yes
2) No

xvii. **Posture Related Problems:** The scale consisted items reflecting posture related problems youth faced due to adopting various postures (good postures as well as poor postures) while using laptop/computer. It was categorized as follows:

1) To Low Extent: 18-29
2) To Some Extent: 30-42
3) To High Extent: 43-54

3.9.2 Coding: Code numbers were given to each response, then the information from each scale of the questionnaire was transferred on coding sheet.

3.9.3 Tabulation: The date was transferred from coding sheet into tabular form to give a clear picture of findings.

3.9.4 Statistical Analysis: The data was analyzed using descriptive as well as relational statistics. The **descriptive analysis** like frequency, percentage and mean, were used to analyze the data. **Relational statistics** like 'F-Ratio' (ANOVA), t-test and Co-efficient of Correlation were applied to test the hypotheses postulated for the study (Table 3).

Table 3: Relational statistics applied to test the hypotheses

Test	Independent and Dependent Variables
t-test	**Independent Variables:** Gender (male or female) and Extent of usage of laptop/computer (one year or more than one year) [section I]
	With
	Dependent Variable: Selected Physical problems viz. musculoskeletal discomfort (faced during last 12 months), vision problems (faced during last 12 months) and posture related problems [Section IV]
(ANOVA) F-test	**Independent Variables:** Age (in years), Educational Qualification, Employment Status, Family Monthly Income (in rupees) [Section I], Amount of time spent in a day by the youth on laptop/computer Viz. spending time in a day on the laptop/computer(in hours) and frequency of usage of laptop/computer by the youth [Section II], Reasons for usage of laptop/computer by the youth viz. study, communication, entertainment and office work [Section III]
	With
	Dependent Variable: Selected Physical problems viz. musculoskeletal discomfort (faced during last 12 months), vision problems (faced during last 12 months) and posture related problems [Section IV]
(co-relation) r-test	**Dependent Variable:** Musculoskeletal discomfort faced by the youth during last 12 months [Section IV]
	With
	Dependent Variable: Posture related problems [Section IV]
(co-relation) r-test	**Dependent Variable:** Vision problems faced by youth during last 12months [Section IV]
	With
	Dependent Variable: Posture related problems [Section IV]

Findings and Discussion

CHAPTER-IV

FINDINGS AND DISCUSSION

This chapter deals with presenting, interpreting and discussing the findings obtained through analysis of the data collected through questionnaire.

The aim of the present study was to find out the amount of time spent in a day by the youth on laptop/computer, reasons for usage of laptop/computer by the youth and extent of selected physical problems faced by youth due to usage of laptop/computer viz. musculoskeletal discomfort, vision problems and posture related problems. In this study the youth of Vadodara city were the key of respondents.

4.1 Background Information

- 4.1.1. Personal Information
- 4.1.2 Family Information
- 4.1.3 Situational Information

4.2 Amount of time spent in a day by the youth on laptop/computer

4.3 Reasons for usage of laptop/computer by the youth

4.4 Extent of selected physical problems faced by youth due to usage of laptop/computer

- 4.4.1. Musculoskeletal Discomfort
- 4.4.2 Vision Problems
- 4.4.3 Posture Related Problems

4.5 Testing of Hypotheses

4.1 Background Information of the respondents

This section deals with background information regarding youth of Vadodara city. The results regarding personal, family and situational variables of the respondents are presented here.

4.1.1. Personal Information: This section contained information regarding age (in years), gender, educational qualification, employment status, height (in cms), weight (in kg) of the respondents.

Table 4: Frequency and percentage distribution of the respondents according to their Personal Information

Sr. No.	Personal Information of the respondents	Respondents (n=120)	
I.	**Age (in years)**	**f**	**%**
	15-16	6	5.00
	17-18	23	19.17
	19-20	20	16.67
	21-22	52	43.33
	23-24	19	15.83
II.	**Gender**		
	Male	54	45.00
	Female	66	55.00
III.	**Educational Qualification**		
	10th Pass	19	15.83
	12th Pass	30	25.00
	Diploma	3	2.50
	Graduate	56	46.67
	Postgraduate	12	10.00
IV.	**Employment Status**		
	Employed	24	20.00
	Unemployed	78	65.00
	Self Employed	18	15.00
V.	**Height (in cms)**		
	74-117	2	1.67
	118-161	1	0.83
	162-205	117	97.50
	Mean	**161.17**	
VI.	**Weight (in kg)**		
	32-49	36	30.00
	50-67	60	50.00
	68-85	24	20.00
	Mean	**55.87**	

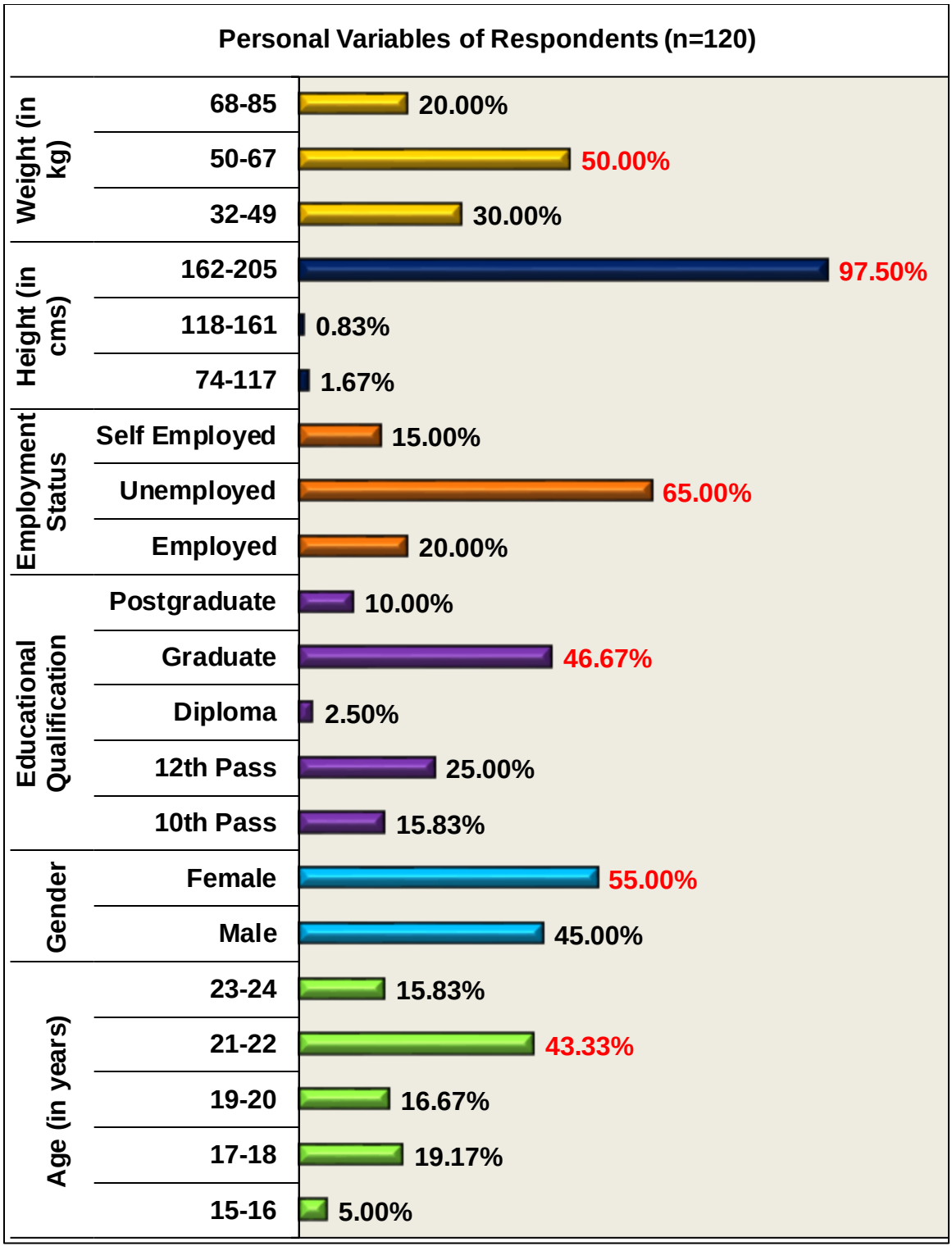

Figure 4: Percentage distribution of the respondents according to their Personal Information

Age (in years): It was found that 43.33 per cent of the respondents were in the age group of 21 to 22 years. Less than one-fourth (19.17%) of the respondents were in the age group of 17 to 18 years. Only 5.00 per cent of the respondents were belonged to 15 to 16 years **(Table 4, Fig 4)**.

Gender: Less than one-half (45.00%) of the respondents were males and more than one-half (55.00%) of the respondents were females **(Table 4, Fig 4)**.

Educational Qualification: Majority of the data revealed that Less than one-half (46.67%) of the respondents were Graduates, one-fourth (25.00%) of the respondents were 12^{th} pass, less than one- fourth (15.83%) of the respondents were 10^{th} pass, 10.00 per cent of the respondents were postgraduate and only 2.50 per cent of the respondents had done diploma **(Table 4, Fig 4)**.

Employment Status: Majority of the respondents i.e. (65.00%) Less than two-third of the respondents were unemployed. It was also found that less than one-fourth (20.00%) of the respondents were employed and 15 per cent of the respondents were self-employed **(Table 4, Fig 4)**.

Height: The data from the table depicted that the height of the respondents ranged between 74 to 205cms and the mean height was 161.17cms. It was found that 97.50 per cent of the respondents were of the height ranging between 162 to 205cms and only 0.83 per cent of the respondents were of the height ranging between 118 to 161cms **(Table 4, Fig 4)**.

Weight: The weight of the respondents ranged between 32 to 85kg and the mean weight was 55.87kg. Majority (50.00%) of the respondents had weight between 50 to 67 kg, while 30 per cent of the respondents weighted between 32 to 49 kg. less than one-fourth (20.00%) of the respondents weighted between 68 to 85kg **(Table 4, Fig 4)**.

4.1.2 Family Information: This section contained family information of the respondents viz. type of family, number of family members and total monthly family income (in rupees).

Table 5: Frequency and percentage distribution of the respondents according to their Family Information

Sr. No.	Family Information of the respondents	Respondents (n=120)	
I.	**Type of family**	**f**	**%**
	Joint	54	45.0
	Nuclear	66	55.0
II.	**Number of Family Members**		
	2-3 Members	19	15.83
	4-5 Members	77	64.17
	6-7 Members	15	12.5
	8 or more	9	7.5
III.	**Total Monthly Family Income (in rupees)**		
	₹10,000 - ₹20,000	33	27.5
	₹20,000 - ₹30,000	23	19.17
	₹30,000 - ₹40,000	24	20.0
	₹40,000 - ₹50,000	15	12.5
	More than ₹50,000	25	20.83

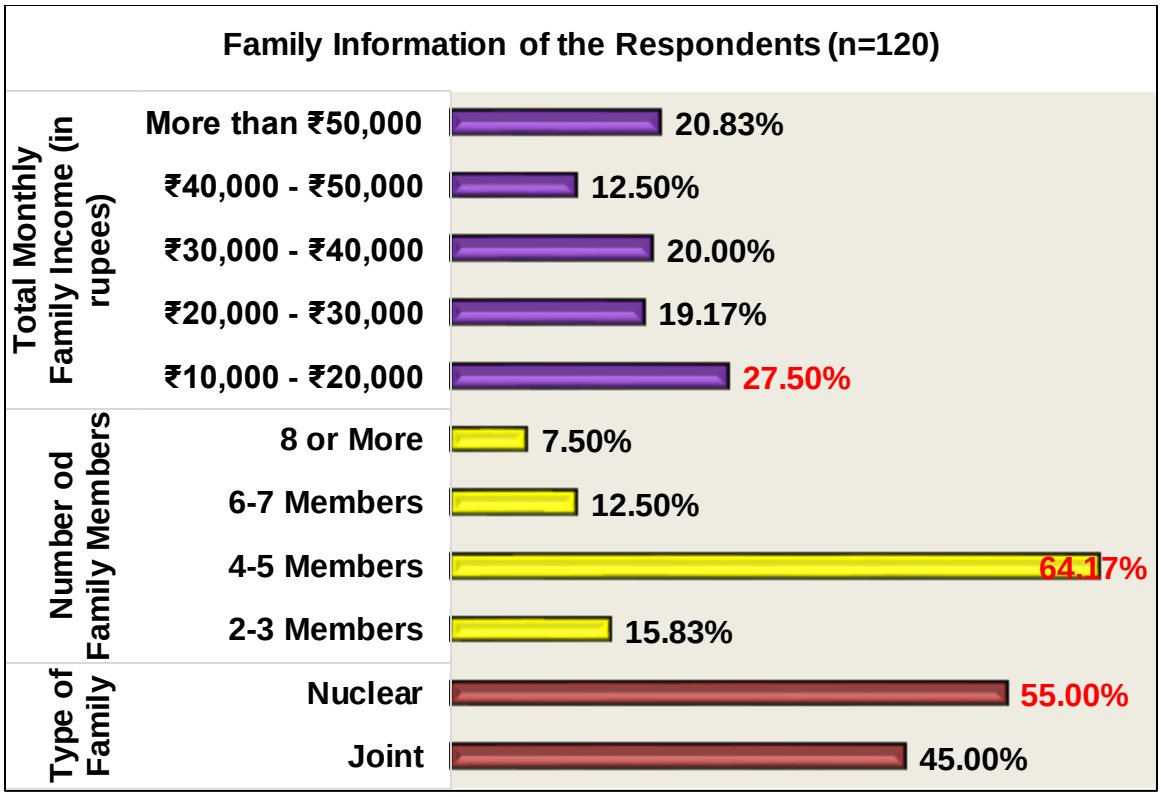

Figure 5: Percentage distribution of the respondents according to their Family Information

Type of family: Less than one-half (45.00%) of the respondents belonged to joint family and more than one-half (55.00%) of the respondents belonged to nuclear family **(Table 5, Fig 5)**.

Number of family members: It was found that 64.17 per cent of the respondents were living with 4-5 members in the family. 15.83 per cent of the respondents were living with 2-3 members in family. 12.50 per cent of the respondents were living with 6-7 members in family and only 7.50 per cent of the respondents were living with 8 or more members in family **(Table 5, Fig 5)**.

Total Monthly Family Income: The findings reflected that 27.50 per cent of the respondent's total monthly family income was between ₹10,000 to ₹20,000. It was also found that 20.83 per cent of the respondent's total monthly family income was more than ₹50,000, 20.00 per cent of the respondent's total monthly

family income were ₹30,000 to ₹40,000. 19.17 per cent of the respondent's total monthly family income were ₹20,000 to ₹30,000. 12.5 per cent of the respondent's total monthly family income ranged between ₹40,000 to ₹50,000 **(Table 5, Fig 5)**.

4.1.3. Situational Information: In this section, usage of laptop/computer related information was gathered.

Table 6: Frequency and percentage distribution of the respondents according to Extent of usage of laptop/computer

Sr. No.	Extent of usage of laptop/computer	Respondents (n=120)	
		f	%
	One year	42	35.0
	More than one year	78	65.0
	Total	**120**	**100**

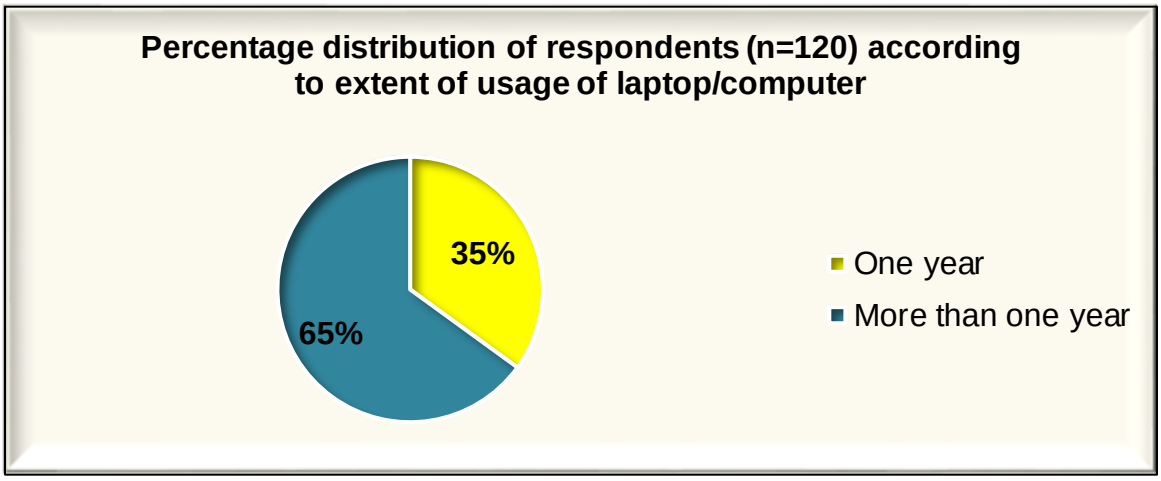

Figure 6: Percentage distribution of the respondents according to Extent of usage of laptop/computer

Extent of usage of laptop/computer: The data revealed that 65.00 per cent of the respondents were using laptop/computer since more than one year and 35.00 per cent of the respondents were using laptop/computer for one year **(Table 6, Fig 6)**.

4.2 Amount of time spent in a day by the youth on laptop/computer

An attempt was made to find out the amount of time spent in a day by the youth on laptop/computer.

Table 7: Frequency and percentage distribution of respondents according to possessing laptop/computer

Respondents (n=120)		
Possessing laptop/computer	**f**	**%**
Laptop	104	86.67
Computer	16	13.33
Total	**120**	**100**

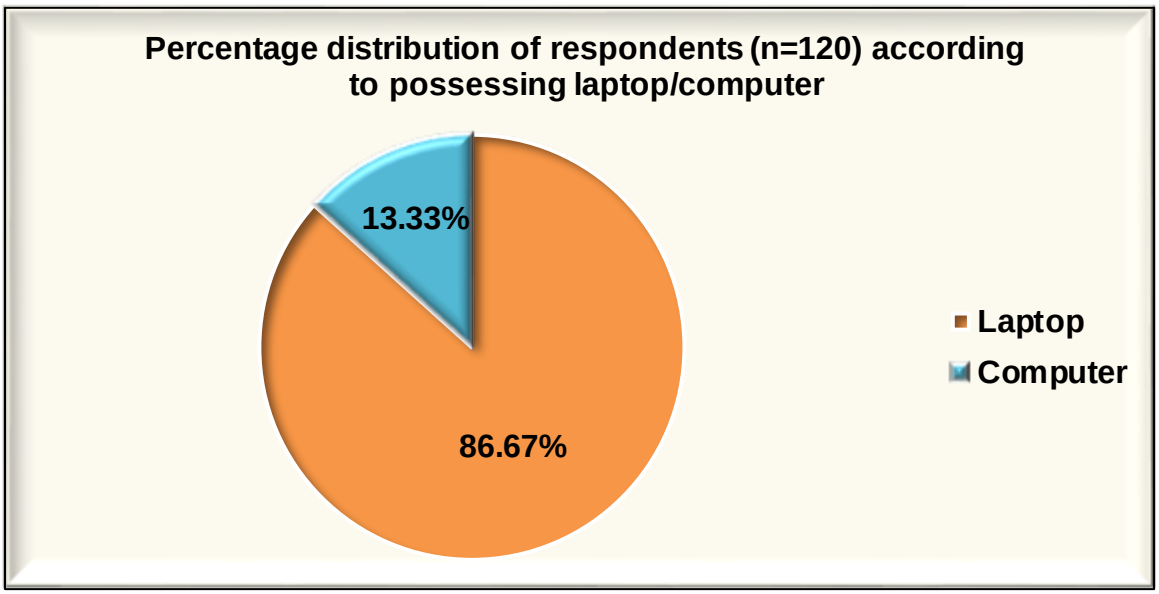

Figure 7: Percentage distribution of the respondents according to possessing laptop/computer.

It was found that majority (86.67%) of the respondents possess laptop and only 13.33 per cent of the respondents possess computer **(Table 7, Fig 7)**.

Table 8: Frequency and percentage distribution of respondents according to possessing knowledge of using laptop/computer

Respondents (n=120)		
Possessing knowledge of using laptop/computer	**f**	**%**
Yes	117	97.50
No	3	2.50
Total	**120**	**100**

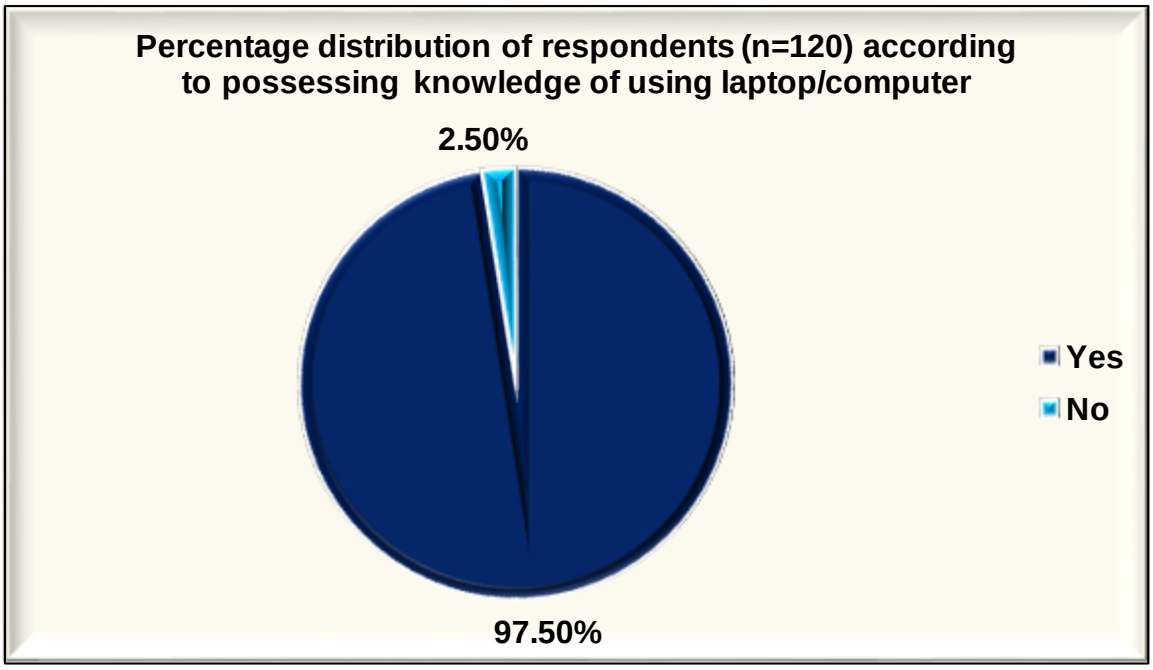

Figure 8: Percentage distribution of the respondents according to possessing knowledge of using laptop/computer

It was found that majority (97.50%) of the respondents possessed knowledge for using laptop/computer and only 2.50 per cent of the respondents did not possess knowledge for using laptop/computer **(Table 8, Fig 8)**.

Table 9: Frequency and percentage distribution of respondents according to spending time in a day on the laptop/computer

Respondents (n=120)		
Spending time in a day on the laptop/computer	**f**	**%**
Less than 60 minutes	27	22.50
1-2 hours	40	33.33
2-4 hours	19	15.83
4-6 hours	18	15.00
Above 6 hours	16	13.33
Total	**120**	**100**

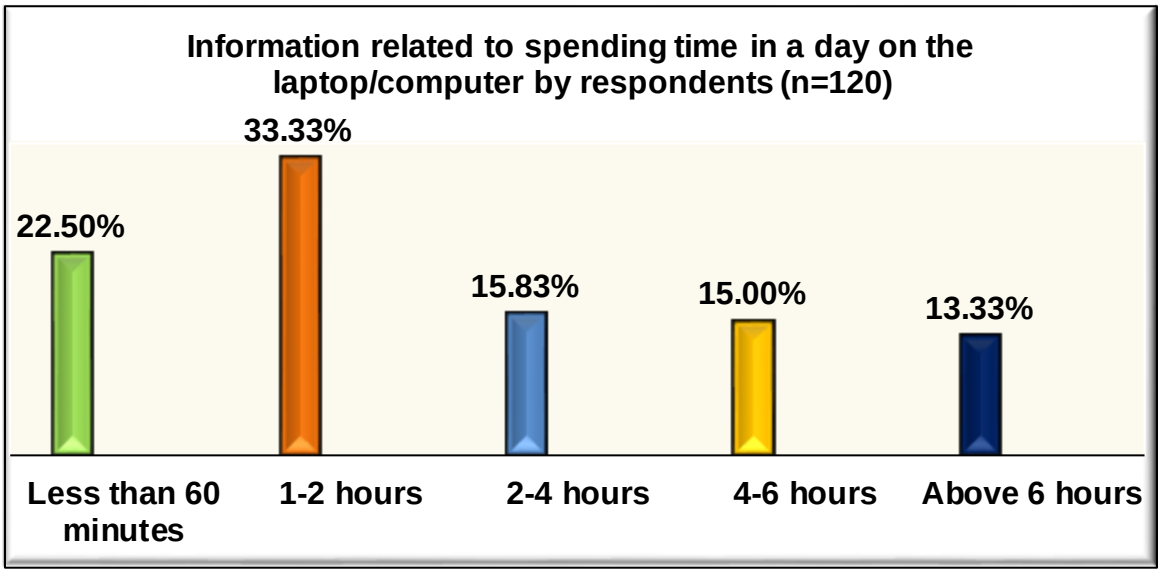

Figure 9: Percentage distribution of the respondents according to spending time in a day on the laptop/computer

It was found that majority (33.33%) of the respondents had spent 1-2hours in a day on the laptop/computer, less than one-fourth (22.50%) of the respondents had spent less than 60 minutes in a day on the laptop/computer, 15.83 per cent of the respondents had spent 2-4 hours in a day on the laptop/computer, 15.00 per cent of the respondents had spent 4-6 hours in a day on the laptop/computer

and only 13.33 per cent of the respondents had spent more than 6 hours in a day on the laptop/computer **(Table 9, Fig 9)**.

Table 10: Frequency and percentage distribution of respondents according to frequency of using laptop/computer more frequently in day

Respondents (n=120)		
Frequency of using laptop/computer more frequently in a day	**f**	**%**
Morning	19	15.83
Afternoon	67	55.83
Evening	16	13.33
Night	18	15.00
Total	**120**	**100**

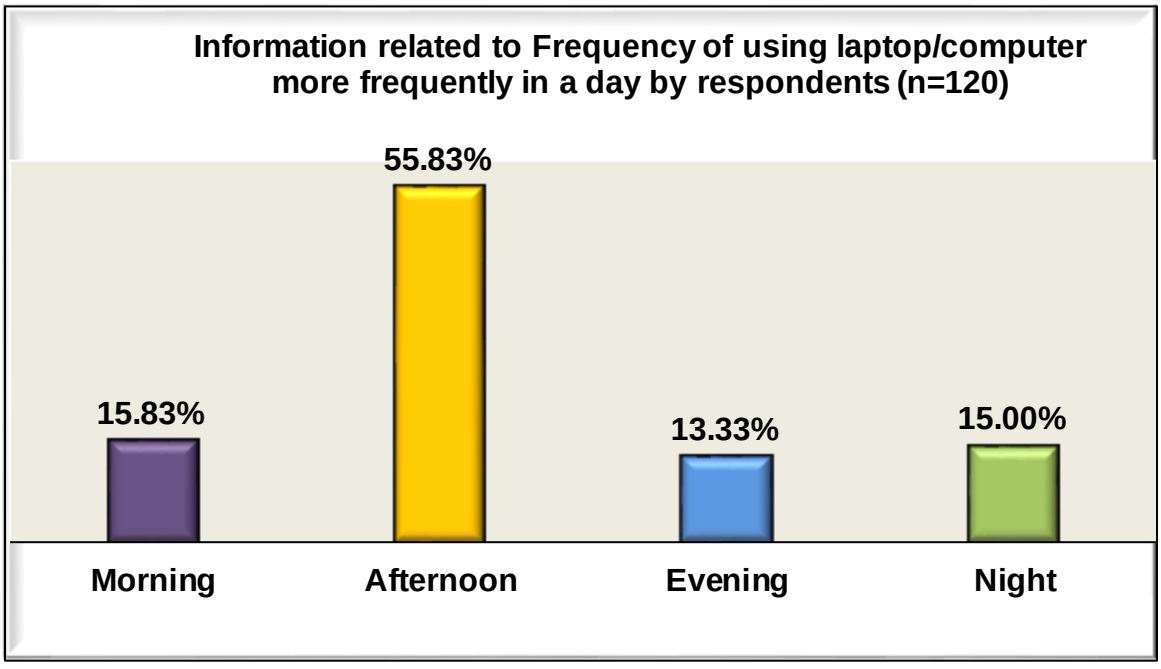

Figure 10: Percentage distribution of the respondents according to frequency of using laptop/computer more frequently in a day

It was found that majority (55.83%) of the respondents used laptop/computer more frequently in afternoon in a day whereas 13.33 per cent of the respondents used laptop/computer more frequently in the evening **(Table 10, Fig 10)**.

4.3 Reasons for usage of laptop/computer by the youth

An attempt was made to find out the reasons for usage of laptop/computer by youth viz. study, communication, entertainment and office work. It had point 3 point continuum for the responses "To High Extent", "To Some Extent" and "To Low Extent" which were scored 3 through 1 respectively.

Table 11: Frequency and percentage distribution of respondents according to the main reasons for using laptop/computer

Respondents (n=120)		
Main reasons of using laptop/computer	**f**	**%**
Study	95	48.72
Communication	26	13.33
Entertainment	48	24.62
Office Work	26	13.33
Total	**195**	**100**

(Note: Multiple Answers)

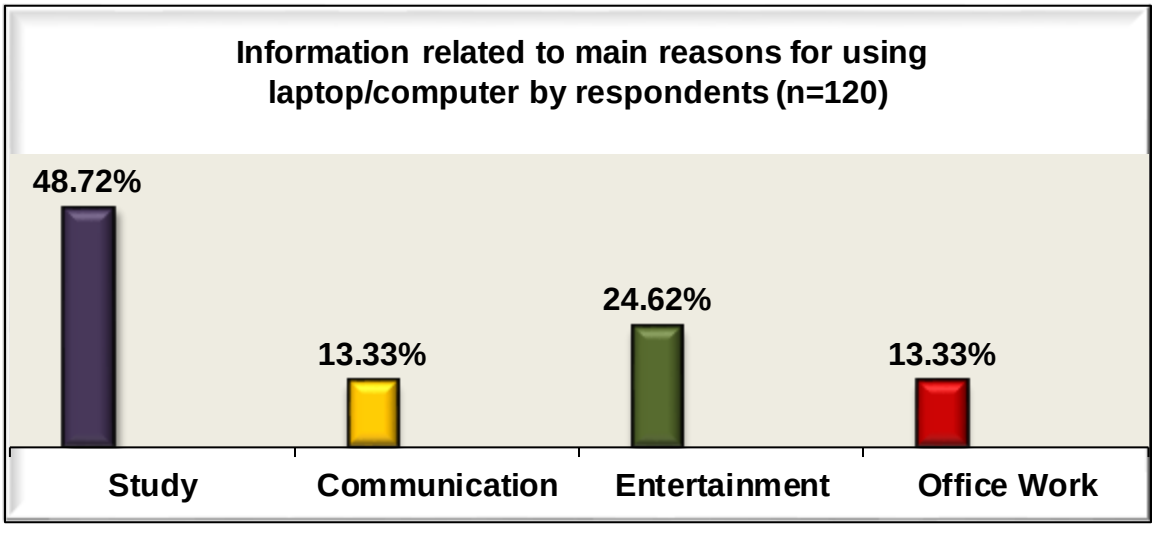

Figure 11: Percentage distribution of the respondents according to main reasons of using laptop/computer

It was found that 48.72 per cent of the respondents used laptop/computer for study purpose, whereas less than one-fourth (24.62%) of the respondents used laptop/computer for entertainment. A similar percentage of the respondents i.e. 13.33 per of them used it for communication and office work respectively **(Table 11, Fig 11)**.

Table 12: Frequency and percentage distribution of respondents according to study as one of the reasons for using laptop/computer

Sr. No	Reasons for using laptop/computer for study	Respondents (120)						
		To High Extent		To Some Extent		To Low Extent		Wt. Mean Score (3-1)
		f	%	f	%	f	%	
i.	Using an online dictionary or encyclopedia.	36	30.00	71	59.17	13	10.83	2.19
ii.	Searching online for information and learning about a topic interested in.	76	63.33	37	30.83	7	5.83	2.58
iii.	Learning about educational software, games and quizzes.	46	38.33	58	48.33	16	13.33	2.25
iv.	Using Word, Excel, Power Point.	58	48.33	49	40.83	13	10.83	2.38
v.	Attending Online Classes and webinar.	50	41.67	50	41.67	20	16.67	2.25
vi.	Participate in online learning programs	40	33.33	55	45.83	25	20.83	2.13
vii.	Download upload or browse learning material for school/college's related work	63	52.50	46	38.33	11	9.17	2.43
viii.	Check the school/college website for announcements, dates, circulars etc.	48	40.00	56	46.67	16	13.33	2.27
	Total							**2.31**

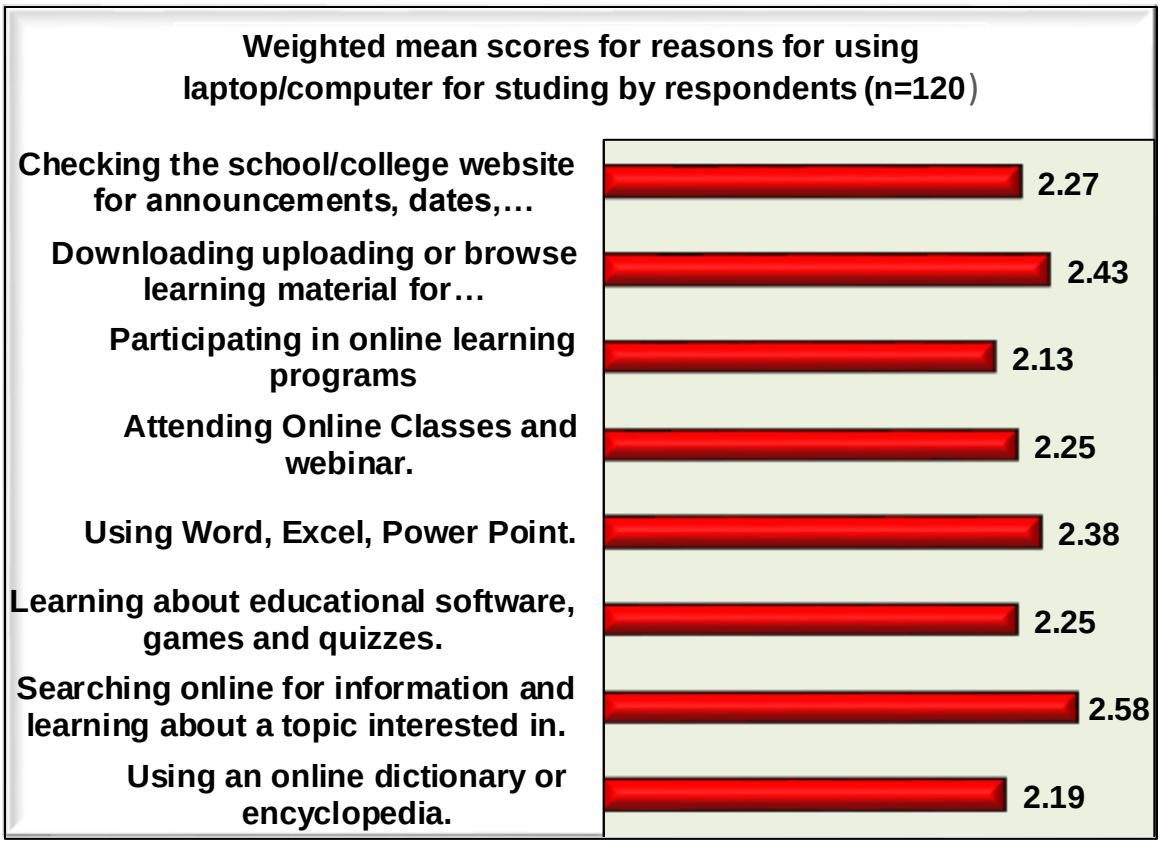

Figure 12: Weighted mean scores for reasons for using laptop/computer for studying by respondents

The data in **Table 12 and Fig. 12**, revealed that 63.33 per cent of the respondents used laptop/computer for searching online for information and learning about a topic they were interested into a high extent. More than one-half (52.50%) of the respondents used laptop/computer for downloading uploading or browse learning material for school/college's related work, and 48.33 per cent of the respondents used laptop/computer for using Word, Excel, Power Point.

The findings on the weighted mean scores for study as one of the reason for using laptop/computer was found high for reasons like searching online for information and learning about a topic interested in (2.58), downloading uploading or browse learning material for school/college's related work (2.43) and using Word, Excel, Power Point (2.38).

Table 13: Frequency and percentage distribution of respondents according to communication as one of the reasons for using laptop/computer.

Sr. No	Reasons for using laptop/computer for communication	Respondents (120)						
		To High Extent		To Some Extent		To Low Extent		Wt. Mean Score (3-1)
		f	%	f	%	f	%	
i.	Making new friends through social networking sites.	33	27.50	53	44.17	34	28.33	1.96
ii.	Taking part in online group discussion or forums.	14	11.67	79	65.83	27	22.50	1.89
iii.	Sending and reading emails.	49	40.83	52	43.33	19	15.83	2.25
iv.	Attending meetings.	36	30.00	61	50.83	23	19.17	2.11
	Total							**2.05**

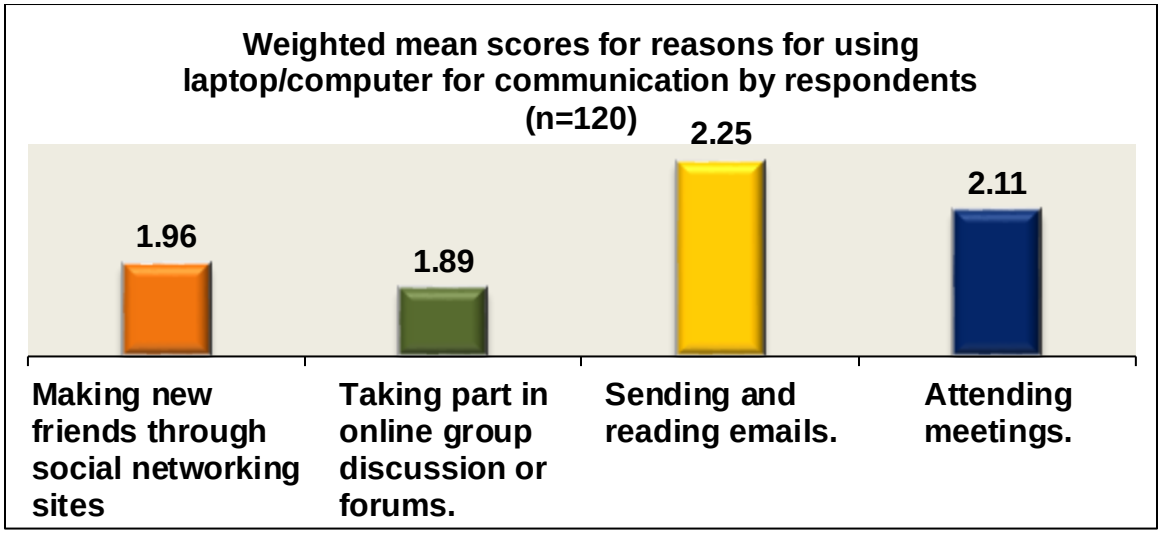

Figure 13: Weighted mean scores for reasons for using laptop/computer for communication by respondents

It was found that 40.83 per cent of the respondents used laptop/computer for sending and reading emails to a high extent. More than one-fourth (30%) of the respondents used laptop/computer for attending meetings and 27.50 per cent of the respondents used laptop/computer for making new friends through social networking sites **(Table 13, Figure 13).**

The mean weighted scores for communication as one of the reasons for using laptop/computer was found high for specific reasons like sending and reading emails (2.25), attending meetings (2.11) and making new friends through social networking sites (1.96) **(Table 13, Figure 13).**

Table 14: Frequency and percentage distribution of respondents according to entertainment as one of the reasons for using laptop/computer

Sr. No	Reasons for using laptop/computer for entertainment	Respondents (120)						
		To High Extent		To Some Extent		To Low Extent		Wt. Mean Score (3-1)
		f	%	f	%	f	%	
i.	Reading or writing the news online.	37	30.83	62	51.67	21	17.50	2.13
ii.	Searching online for practical information (e.g. seats at a match, concert, movie, shopping, train times, health).	34	28.33	69	57.50	17	14.17	2.14
iii.	Playing games	33	27.50	49	40.83	38	31.67	1.96
iv.	Browsing the internet for fun (e.g. watching video clips, download music, using social media).	45	37.50	61	50.83	14	11.67	2.26
v.	Going online.	52	43.33	57	47.50	11	9.17	2.34
	Total							**2.17**

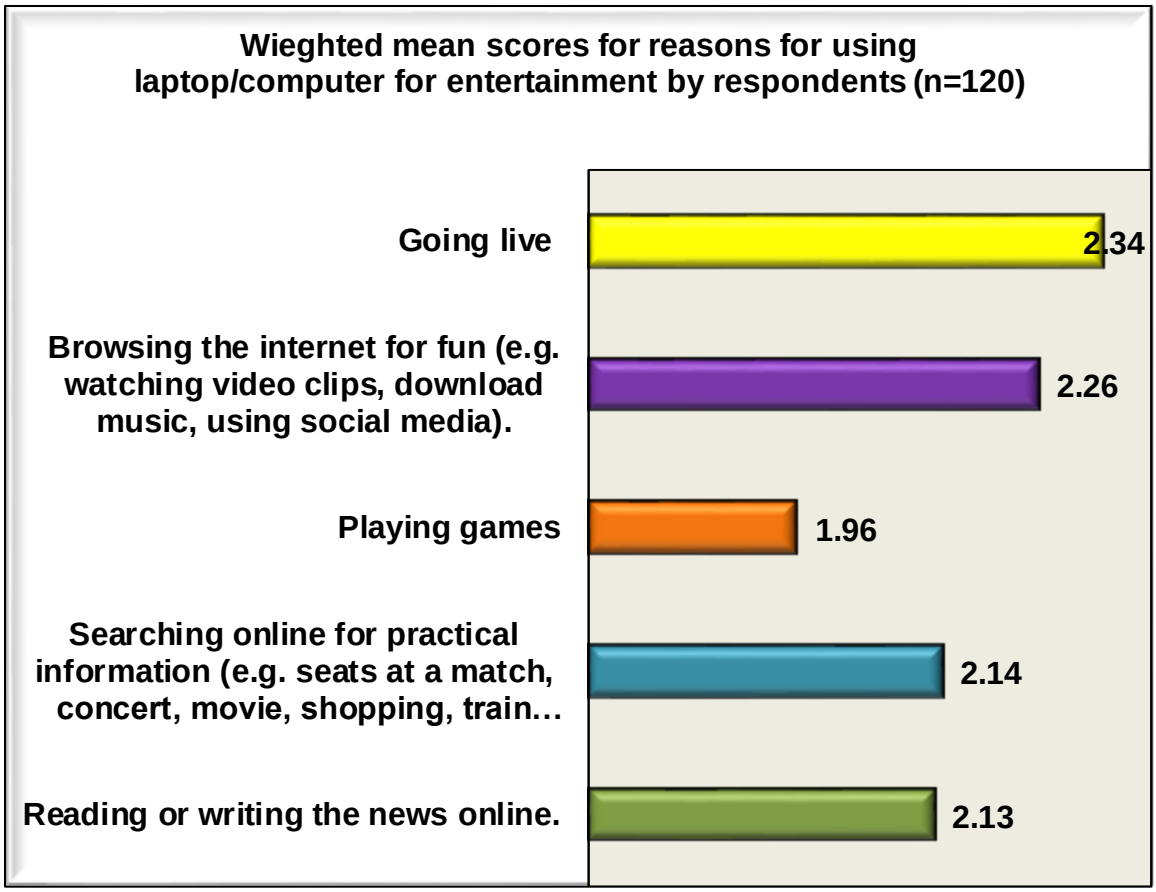

Figure 14: Weighted mean scores for reasons for using laptop/computer for entertainment by respondents

It was found that 43.33 per cent of the respondents used laptop/computer for going live to a high extent. Majority 37.50 per cent of the respondents used laptop/computer to browse the internet for fun (e.g. watching video clips, download music, using social media) to a high extent **(Table 14, Figure 14).**

The findings on the weighted mean scores for entertainment as one of the reasons for using laptop/computer was found high for reasons like going live (2.34), browsing the internet for fun (e.g. watching video clips, download music, using social media) (2.26) and (2.14) for searching online for practical information (e.g. seats at a match, concert, movie, shopping, train times, health) and playing games **(Table 14, Figure 14).**

Table 15: Frequency and percentage distribution of respondents according to office work as one of the reasons for using laptop/computer

Sr. No	Reasons for using laptop/computer for office work	Respondents (120)						
		To High Extent		To Some Extent		To Low Extent		Wt. Mean Score (3-1)
		f	%	f	%	f	%	
i.	Marketing products	20	16.67	26	21.67	74	61.66	1.55
ii.	Data typing work	20	16.67	39	32.50	61	50.83	1.66
iii.	Programming	23	19.17	33	27.50	64	53.33	1.66
iv.	Attending meeting's, workshops and conferences	28	23.33	42	35.00	50	41.67	1.82
v.	Making online Transactions	35	29.17	44	36.67	41	34.17	1.95
	Total							**1.73**

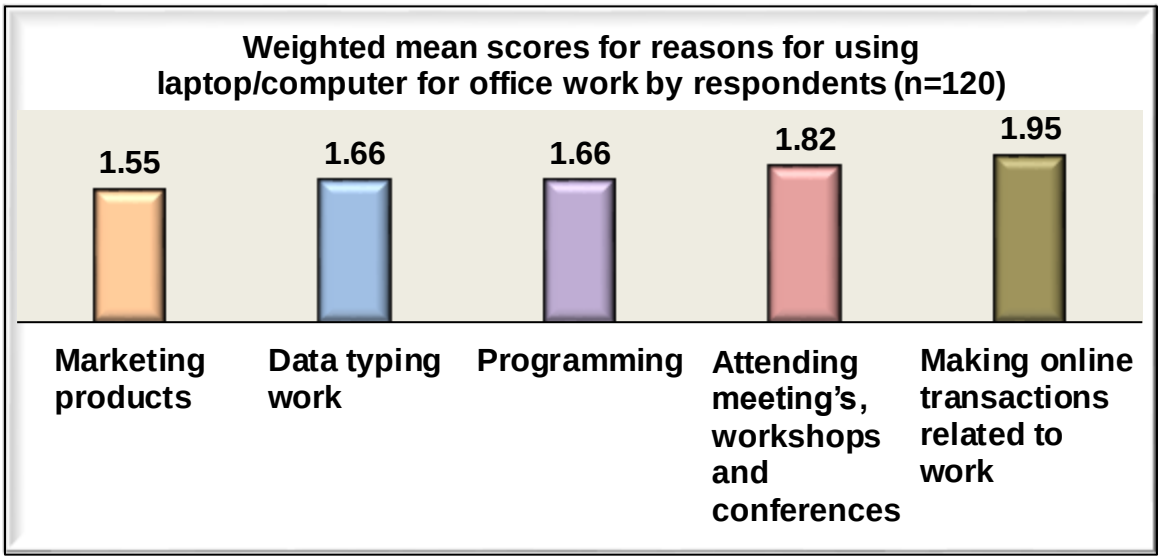

Figure 15: Weighted mean scores for reasons for using laptop/computer for office work by respondents

It was found that more than one-fourth (29.17%) of the respondents were using laptop/computer for making online transactions related to work to a high extent and 16.67 per cent of the respondents for marketing products and data typing work **(Table 15, Figure 15).**

The weighted mean scores for office work as one of the reasons for using laptop/computer were found high for reasons like making online transactions related to work (1.95) and attending meetings, workshops and conferences (1.82) **(Table 15, Figure 15).**

Table 16: Frequency and percentage distribution of respondents according to reasons for usage of laptop/computer by the youth

Sr. No.	Reasons for using laptop/computer	Respondents (120)			
		Range score	f	%	Wt. Mean Score (3-1)
A.	**Study**				
1.	To Low Extent	8-13	22	18.33	2.31
2.	To Some Extent	14-19	89	74.17	
3.	To High Extent	20-24	9	7.5	
B.	**Communication**				
1.	To Low Extent	4-6	37	30.83	2.05
2.	To Some Extent	7-9	78	65.00	
3.	To High Extent	10-12	5	4.17	
C.	**Entertainment**				
1.	To Low Extent	5-8	11	9.17	2.17
2.	To Some Extent	9-12	75	62.50	
3.	To High Extent	13-15	34	28.33	
D.	**Office Work**				
1.	To Low Extent	5-8	10	8.33	1.73
2.	To Some Extent	9-12	36	30.00	
3.	To High Extent	13-15	74	61.67	
Overall					
1.	To Low Extent	22-36	10	8.33	**2.13**
2.	To Some Extent	37-51	85	70.83	
3.	To High Extent	52-66	25	20.83	

A probe was made to find out the reasons for usage of laptop/computer by the youth viz. study, communication, entertainment and office work. The scores on each of the reasons were summated and possible range of minimum and maximum scores were divided into three categories having equal interval. The minimum score for reason of study was 8 and maximum score was 24. The minimum score for reason of communication was 4 and maximum score was 12. The minimum score for reason of entertainment was 5 and maximum score was 15. The minimum score for reason of office work was 5 and maximum score was 15. It was found from the analysis of weighted mean scores that study was major reason for usage of laptop/computer by the youth **(Table 16).**

4.4 Extent of selected physical problems faced by youth due to usage of laptop/computer: An attempt was made to find out the physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer.

4.4.1. Musculoskeletal Discomfort:

In order to find out the discomfort faced by the youth, a standardized questionnaire i.e., Modified Version of Nordic musculoskeletal questionnaire was used. The Modified Version of Nordic Musculoskeletal Questionnaire included questions related to the discomfort faced by the respondents in their neck, shoulder, upper back, elbows, wrist/hands, lower back, hips/thighs, knees, ankles/feet. In this questionnaire respondents were asked whether they had any discomfort in the last 12 months and last 7 days respectively. Further questions were also asked whether the discomfort had prevented them to carry out their normal activities i.e., household activities etc. And whether they had consulted a physician for this condition.

Table 17: Frequency and percentage distribution of respondents according to discomforts faced in their body parts during the last 12 months and last 7 days from the time of data collection

Sr. No.	Body Parts	Respondents (n=120)							
		Discomfort during last 12 months				Discomfort during last 7 days			
		Yes		No		Yes		No	
		f	%	f	%	F	%	f	%
i.	Neck	80	66.67	40	33.33	57	47.50	63	52.50
ii.	Shoulder	55	45.83	65	54.17	33	27.50	87	72.50
iii.	Upper back	54	45.00	66	55.00	38	31.67	82	68.33
iv.	Elbows	27	22.50	93	77.50	21	17.50	99	82.50
v.	Wrists/Hands	49	40.83	71	59.17	22	18.33	98	81.67
vi.	Lower back	63	52.50	57	47.50	42	35.00	78	65.00
vii.	Hips/Thighs	23	19.17	97	80.83	22	18.33	98	81.67
viii.	Knees	36	30.00	84	70.00	22	18.33	98	81.67
ix.	Ankles/Feet	24	20.00	96	80.00	25	20.83	95	79.17

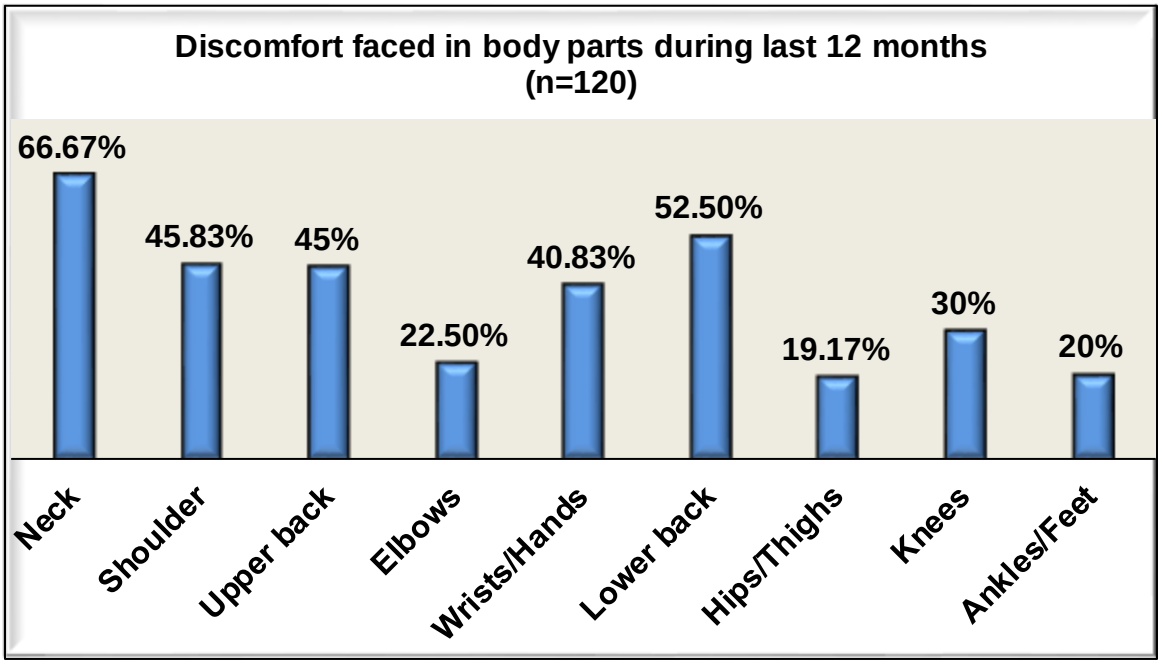

Figure 16: Percentage distribution of the respondents according to discomforts faced in their body parts during the last 12 months

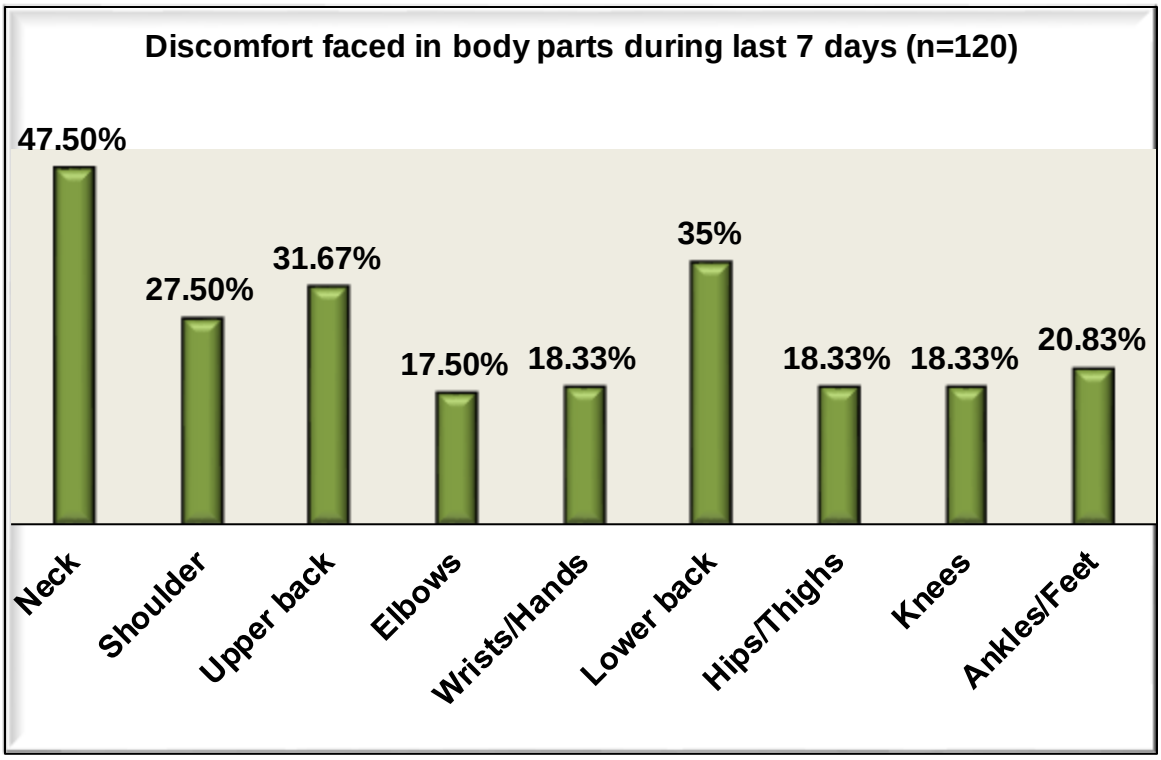

Figure 17: Percentage distribution of the respondents according to discomforts faced in their body parts during the last 7 days

It was found that majority 66.67 per cent of the respondents faced discomfort in neck during last 12 months. More than one-half (52.50%) of the respondents faced discomfort in lower back during last 12 months. Less than one-half of the respondents faced discomfort in shoulder (45.83%) and upper back (45%) during last 12 months. It was also found that only 20 per cent of the respondents faced discomfort in ankles/feet during last 12 months **(Table 17, Figure 16).**

The data in the **Table 17, Figure 17** also reflected discomfort faced by respondents since last 7 days. Majority 47.50 per cent of the respondents faced discomfort in neck. More than one-fourth (35%) of the respondents faced discomfort in lower back. More than one-fourth (31.67%) of the respondents faced discomfort in upper back. Moreover, only 17.50 per cent of the respondents faced discomfort in elbows.

Table 18: Frequency and percentage distribution of respondents according to discomforts in their body parts that prevented the youth from carrying out their normal activities during last 12 months from the time of data collection

Sr. No.	Body Parts that prevented from carrying out normal activities during last 12 months	Respondents (n=120)			
		Yes		No	
		f	%	f	%
i.	Neck	54	45.00	66	55.00
ii.	Shoulder	37	30.83	83	69.17
iii.	Upper back	43	35.83	77	64.17
iv.	Elbows	14	11.67	106	88.33
v.	Wrists/Hands	32	26.67	88	73.33
vi.	Lower back	45	37.50	75	62.50
vii.	Hips/Thighs	26	21.67	94	78.33
viii.	Knees	25	20.83	95	79.17
ix.	Ankles/Feet	25	20.83	95	79.17

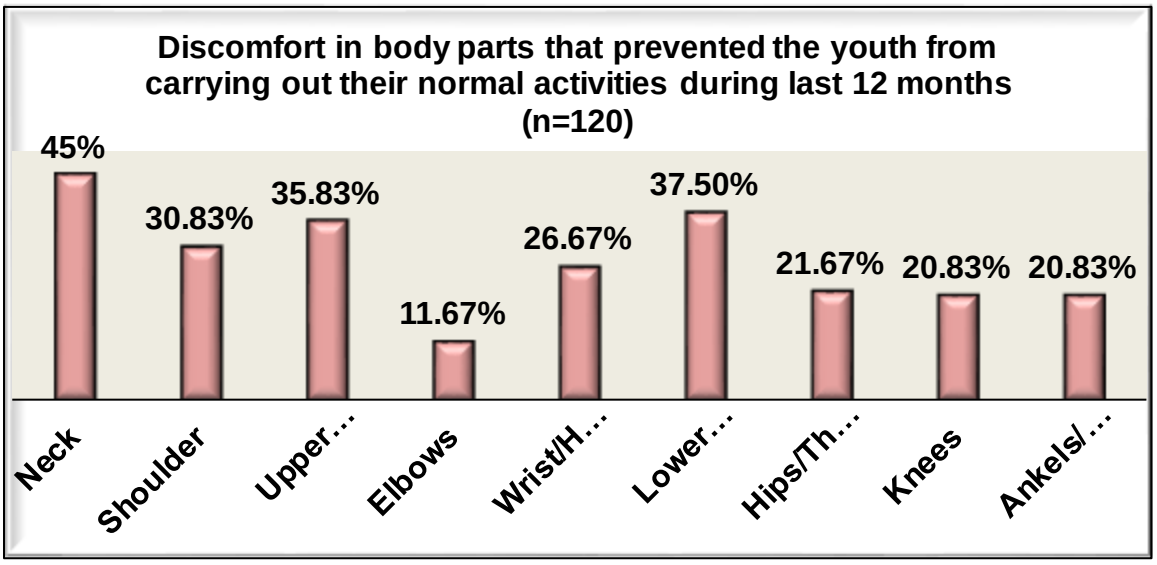

Figure 18: Percentage distribution of the respondents according to discomforts in their body parts that prevented the youth from carrying out their normal activities during last 12 months

It was revealed that 45 per cent of the respondents faced discomfort in neck during last 12 months which prevented them from carrying out their normal activities, whereas 37.50 per cent of the respondents faced discomfort in lower back. Further only 11.67 per cent of the respondents faced discomfort in elbows **(Table 18, Figure 18).**

Table 19: Frequency and percentage distribution of respondents according to frequency of consulting a physician for discomfort faced in body parts during last 12 months.

Sr. No.	Consulting a physician for discomfort faced in body parts during last 12 months.	Respondents (n=120)			
		Yes		No	
		f	%	f	%
i.	Neck	25	20.83	95	79.17
ii.	Shoulder	16	13.33	104	86.67
iii.	Upper back	16	13.33	104	86.67
iv.	Elbows	8	6.67	112	93.33
v.	Wrists/Hands	13	10.83	107	89.17
vi.	Lower back	18	15.00	102	85.00
vii.	Hips/Thighs	12	10.00	108	90.00
viii.	Knees	12	10.00	108	90.00
ix.	Ankles/Feet	7	5.83	113	94.17

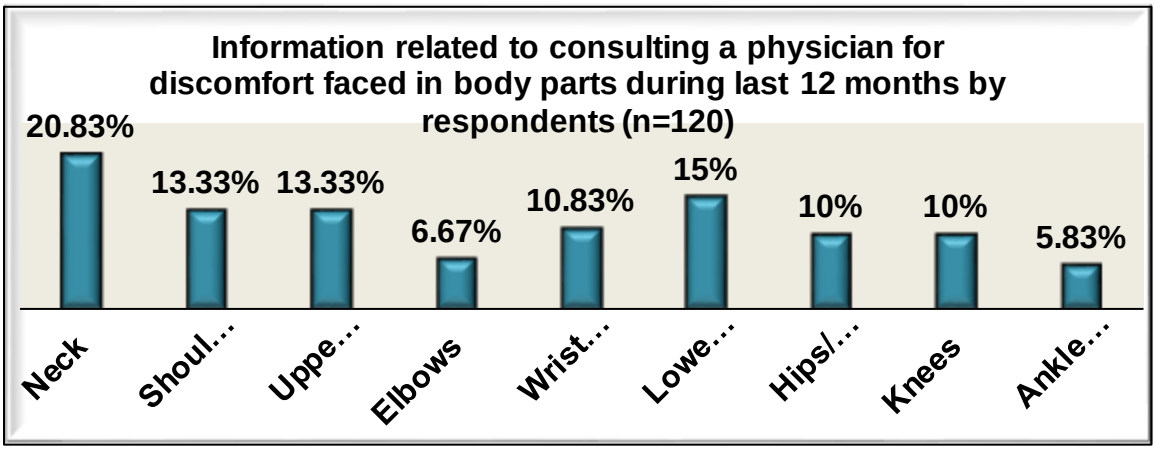

Figure 19: Percentage distribution of the respondents according to consulting a physician for discomfort faced in body parts during last 12 months

It was found that during last 12 months majority 20.83 per cent of the respondents faced discomfort in neck due to which they had consulted a physician. Moreover 10 per cent of the respondents faced discomfort in hips/thighs and knees. Only 5.83 per cent of the respondents faced discomfort in ankles/feet **(Table 19, Figure 19).**

4.4.2 Vision Problem: In order to find out the vision problems faced by the youth, self-made questionnaire was used. The questionnaire included questions relating to headache, tiredness, eyestrain, blurred vision, double vision, red eyes, eye irritation, dry eyes and back pain. In this questionnaire respondents were asked whether they had vision problems during the last 12 months and last 7days respectively. The questions also included whether the vision problem had prevented them to carry out their normal activities and whether they had consulted an ophthalmologist for this condition.

Table 20: Frequency and percentage distribution of respondents according to vision problems faced during the last 12 months and 7 days from the time of data collection

Sr. No.	Vision Problems	Respondents (n=120)							
		Vision problems during last 12 months				Vision problems during last 7 days			
		Yes		No		Yes		No	
		f	%	f	%	f	%	f	%
i.	Headache	84	70.00	36	30.00	52	43.33	68	56.67
ii.	Tiredness	61	50.83	59	49.17	51	42.50	69	57.50
iii.	Eyestrain	49	40.83	71	59.17	39	32.50	81	67.50
iv.	Blurred Vision	36	30.00	84	70.00	31	25.83	89	74.17
v.	Double Vision	21	17.50	99	82.50	24	20.00	96	80.00
vi.	Red Eyes	31	25.83	89	74.17	27	22.50	93	77.50
vii.	Eye Irritation	49	40.83	71	59.17	36	30.00	84	70.00
viii.	Dry Eyes	30	25.00	90	75.00	31	25.83	89	74.17
ix.	Back Pain	62	51.67	58	48.33	47	39.17	73	60.83

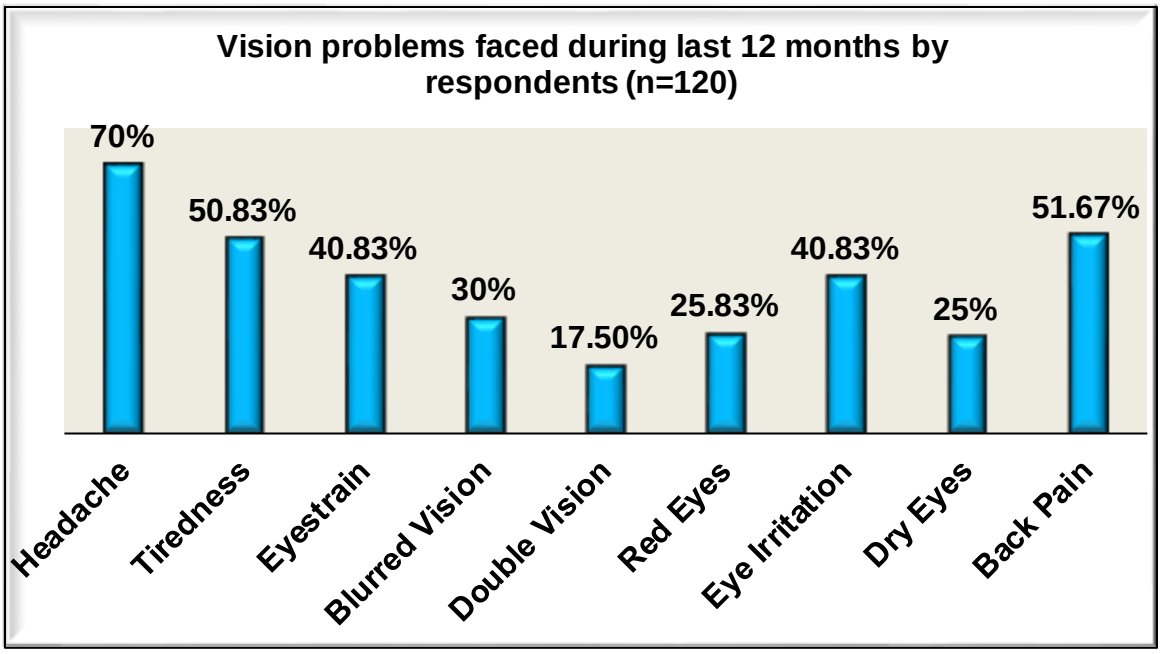

Figure 20: Percentage distribution of the respondents according to vision problems faced during the last 12 months

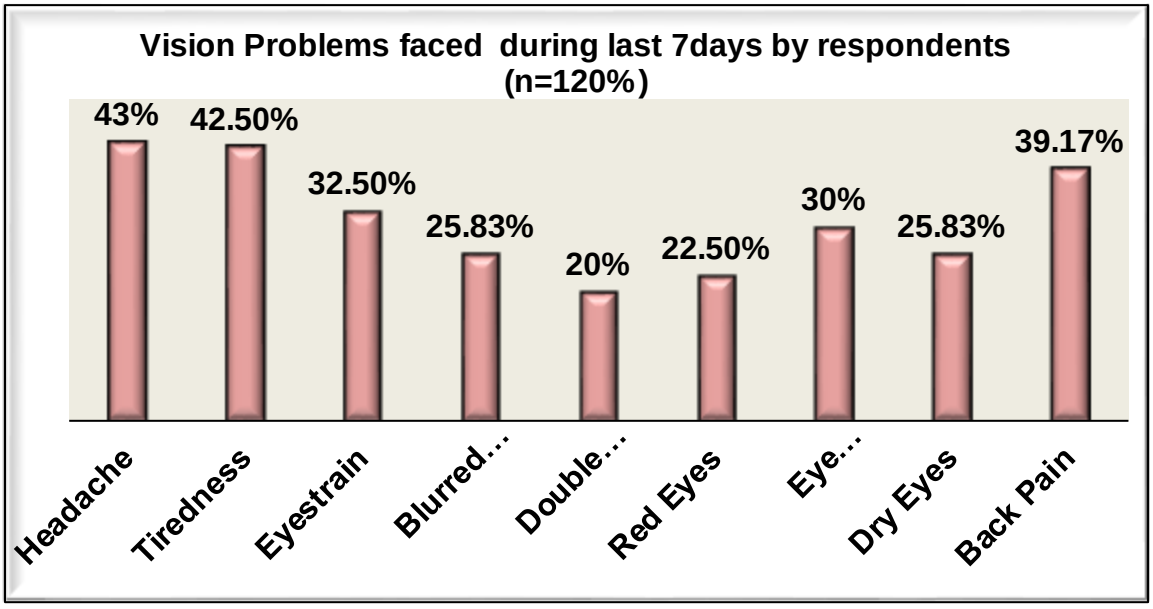

Figure 21: Percentage distribution of the respondents according to vision problems faced during the last 7 days

It was found that less than three fourth (70%) of the respondents faced headache during last 12 months. More than one half (51.67) of the respondents faced back pain during last 12 months. Moreover 40.83 per cent of the respondents faced eyestrain and eye irritation during last 12 months. Only 17.5 per cent of the respondents faced double vision during last 12 months **(Table 20, Figure 20).**

It was found that less than one half (43.33%) of the respondents faced headache since last 7 days. Less than one half (42.50%) of the respondents faced tiredness since last 7 days. More than one fourth (25.83%) of the respondents faced blurred vision and dry eyes since last 7 days. Only 20 percent of the respondents faced double vision since last 7 days **(Table 20, Figure 21).**

Table 21: Frequency and percentage distribution of respondents according to different vision problems faced which prevented youth from carrying out their normal activities during last 12 months

Sr. No.	Vision Problems which prevented from carrying out normal activities during last 12 months.	Respondents (n=120)			
		Yes		No	
		f	%	f	%
i.	Headache	62	51.67	58	48.33
ii.	Tiredness	47	39.17	73	60.83
iii.	Eyestrain	41	34.17	79	65.83
iv.	Blurred Vision	27	22.50	93	77.50
v.	Double Vision	23	19.17	97	80.83
vi.	Red Eyes	23	19.17	97	80.83
vii.	Eye Irritation	36	30.00	84	70.00
viii.	Dry Eyes	29	24.17	91	75.83
ix.	Back Pain	51	42.50	69	57.50

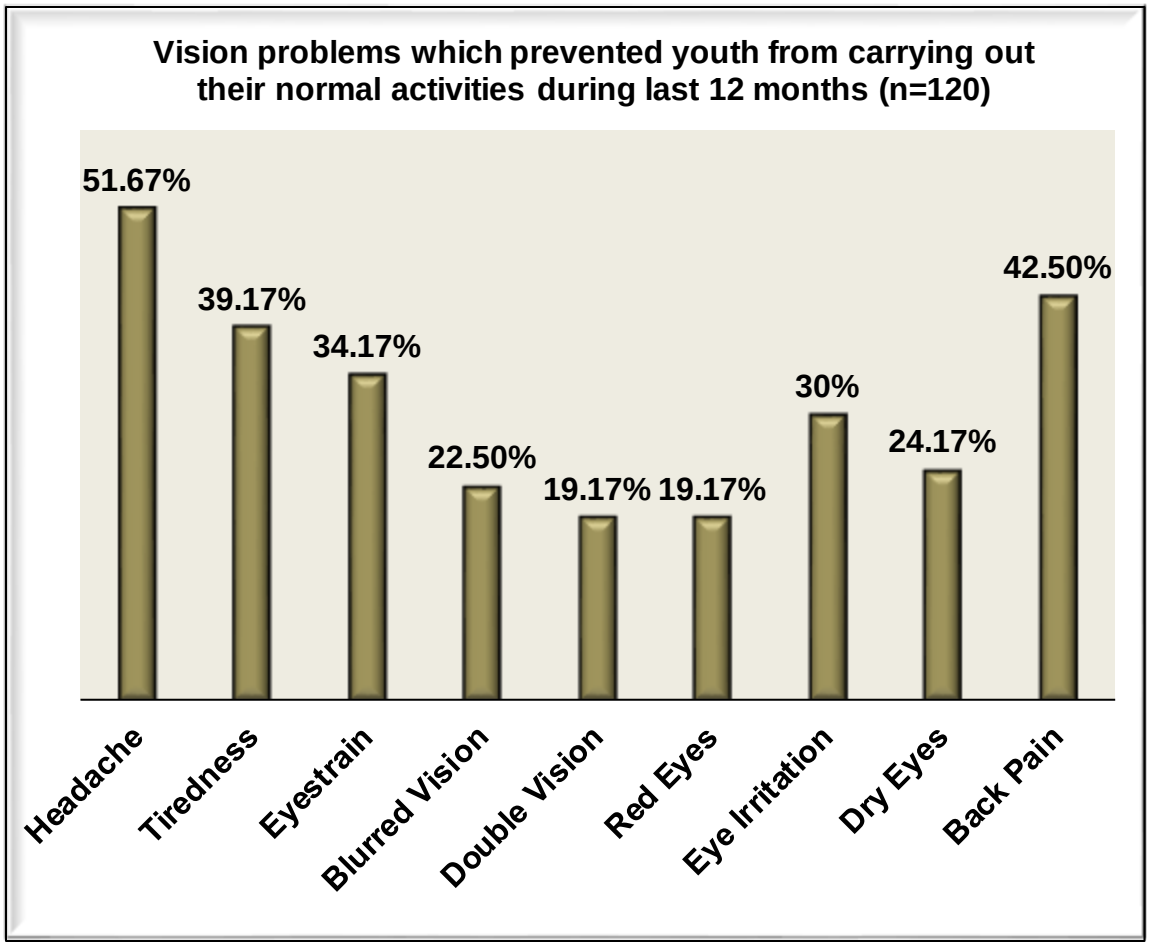

Figure 22: Percentage distribution of the respondents according to different vision problems faced which prevented youth from carrying out their normal activities during last 12 months

The findings in the **Table 21, Figure 22** revealed that the different vision problems faced by the respondents which prevented youth from carrying out their normal activities. It was found that more than one half (51.67%) of the respondent faced headache. Less than one half (42.50%) of the respondents faced back pain during last 12 month. Less than one fourth (22.50%) of the respondents faced blurred vision during last 12 month. Only 19.17 per cent of the respondents faced double vision and red eyes.

Table 22: Frequency and percentage distribution of respondents according to different vision problems faced by the respondents during last 12 months due to which consulted an ophthalmologist

Sr. No.	Vision Problems faced during last 12 months due to which consulted an ophthalmologist	Respondents (n=120)			
		Yes		No	
		f	%	f	%
i.	Headache	40	33.33	80	66.67
ii.	Tiredness	32	26.67	88	73.33
iii.	Eyestrain	27	22.50	93	77.50
iv.	Blurred Vision	16	13.33	104	86.67
v.	Double Vision	9	7.50	111	92.50
vi.	Red Eyes	12	10.00	108	90.00
vii.	Eye Irritation	24	20.00	96	80.00
viii.	Dry Eyes	19	15.83	101	84.17
ix.	Back Pain	24	20.00	96	80.00

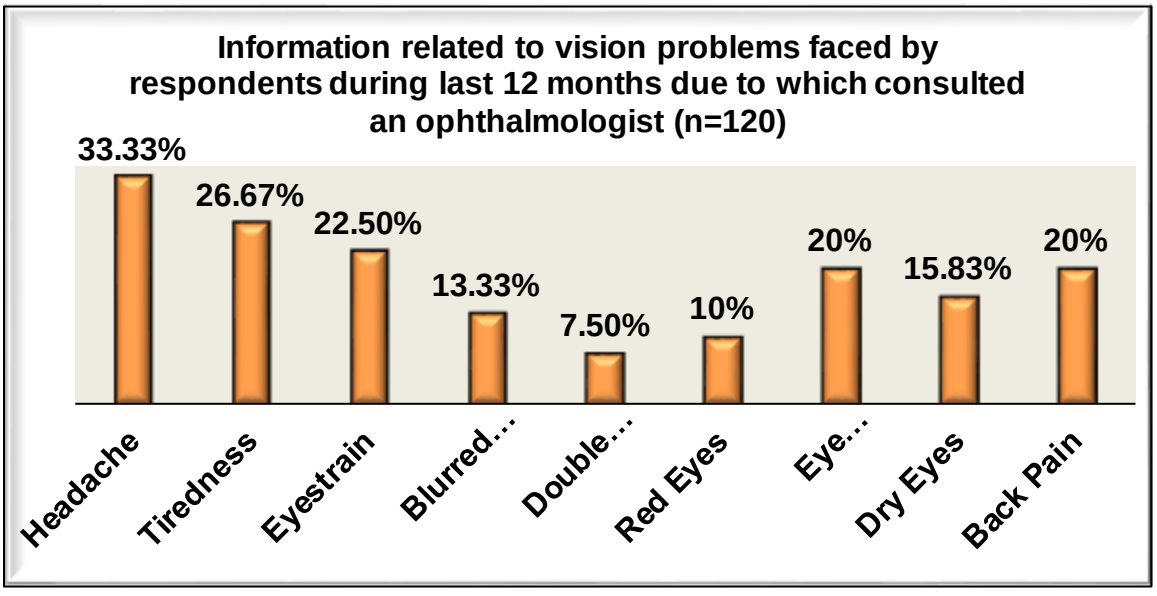

Figure 23: Percentage distribution of the respondents according to different vision problems faced by the respondents during last 12 months due to which consulted an ophthalmologist

The findings in the **Table 22, Figure 23** revealed that the different vision problems faced by respondents during last 12months due to which consulted an ophthalmologist. It was found that 33.33 per cent of the respondents faced headache during last 12 months. More than one fourth (26.67%) of the respondents faced tiredness during last 12 months. A very few i.e. 20 per cent of the respondents faced eye irritation and back pain during last 12 months and only 7.50 per cent of the respondents faced double vision during last 12 months.

4.4.3 Posture Related Problem

In order to find out the posture related problems faced by the youth, self-made questionnaire was used. The questionnaire included questions relating to adoption of postures (good postures as well as poor postures) by youth while using laptop/computer. It had point 3 point continuum for the responses structure was categorized “To High Extent”, “To Some Extent” and “To Low Extent” which were scored 3 through 1 respectively.

Table 23: Frequency and percentage distribution of respondents according to posture adopted by respondents while operating laptop/computer

Sr. No	Postures adopted by respondents	Respondents (120)						
		To High Extent		To Some Extent		To Low Extent		Wt. Mean Score (3-1)
		f	%	f	%	f	%	
1.	Not bending or thrusting forward while operating laptop/computer.	9	7.50	74	61.7	37	30.83	1.77
2.	Sitting for long hours in one position while operating laptop/computer.	47	39.17	56	46.67	17	14.17	2.25
3.	Sitting with lifted shoulder for more than 2hour while operating laptop/computer.	29	24.17	62	51.67	29	24.17	2.15
4.	Sitting with awkward posture (back bended) while operating laptop/computer.	28	23.33	69	57.50	23	19.17	2.04
5.	Performing repetitive tasks while operating laptop/computer.	24	20.00	71	59.17	25	20.83	1.99
6.	Keeping hand placed in a straight line with your lower arm while operating laptop/computer.	20	16.67	74	61.67	26	21.66	1.95
7.	Keeping head in a bended position while operating laptop/computer.	32	26.67	60	50.00	28	23.33	2.03
8.	Keeping head twisted towards the left and right while operating laptop/computer.	33	27.50	67	55.83	20	16.67	2.11
9.	Sitting on the floor and using Laptop.	20	16.67	65	54.17	35	29.16	1.88

10.	Seeing the screen at an awkward angle while operating laptop/computer.	25	20.83	50	41.67	45	37.50	1.83
11.	Bending wrist to use the keyboard while operating laptop/computer.	17	14.17	70	58.33	33	27.50	1.87
12.	Keeping spine in a correct position while operating laptop/computer.	21	17.50	68	56.67	31	25.83	1.92
13.	Taking frequent stretch breaks every 30 to 40 minutes while operating laptop/computer.	28	23.33	62	51.67	30	25.00	1.98
14.	Remaining in a static posture for long periods of time while operating laptop/computer.	23	19.17	69	57.50	28	23.33	1.96
15.	Tilting head while operating laptop/computer.	18	15.00	75	62.50	27	22.50	1.93
16.	Keeping feet rest flat on the floor while operating laptop/computer.	22	18.33	68	56.67	30	25.00	1.93
17.	Keeping thighs in parallel to the floor while operating laptop/computer.	18	15.00	59	49.17	43	35.83	1.79
18.	Sitting with the back support while operating laptop/computer.	19	15.83	69	57.50	32	26.67	1.89
	Total							**1.90**

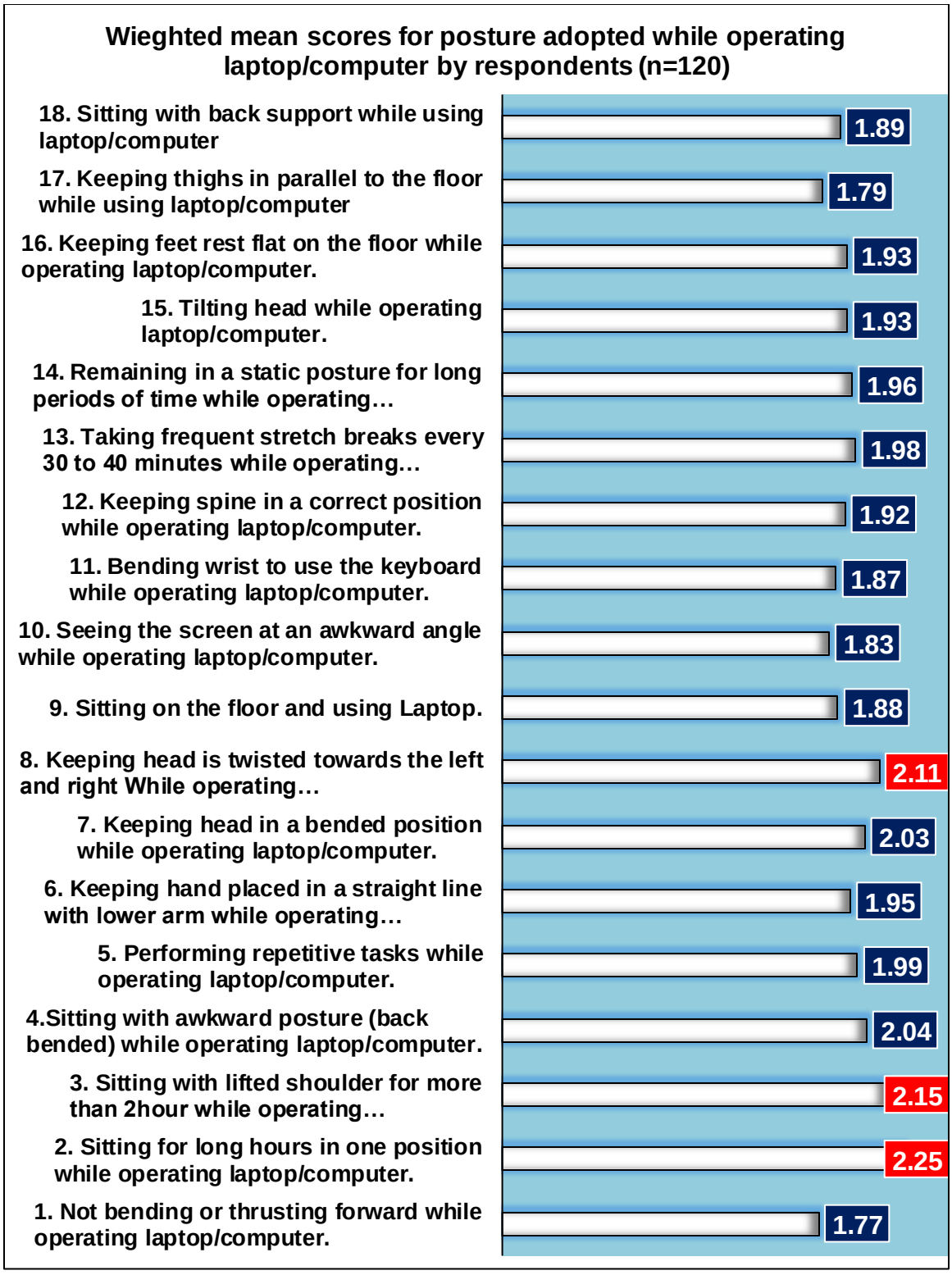

Figure 24: Weighted mean scores for posture adopted by respondents while operating laptop/computer

The findings in the **Table 23, Figure 24** revealed that 39.17 per cent of the respondents were sitting for long hours in one position while operating laptop/computer. Less than one-fourth (24.17%) of the respondents Sitting with lifted shoulder for more than 2hour while operating laptop/computer. More than one half (27.50%) of the respondents kept their head twisted towards the left and right while operating laptop/computer.

The findings related to weighted mean scores was found high for different postures adopted by the respondents like sitting for long hours in one position while operating laptop/computer (2.25), Sitting with lifted shoulder for more than 2 hour while operating laptop/computer (2.15), kept their head twisted towards the left and right while operating laptop/computer (2.11).

Table 24: Frequency and percentage distribution according to score range of posture adopted by the respondents while operating laptop/computer

Sr. No.	Postures adopted by respondents	Respondents (120)			
		Range score	f	%	Wt. Mean Score (3-1)
1.	To Low Extent	8-29	8	6.67	1.90
2.	To Some Extent	30-42	110	91.67	
3.	To High Extent	43-54	2	1.66	

In **Table 24**, the overall data revealed that 91.67 per cent of the respondents adopted posture to some extent and 1.66 per cent of the respondents adopted posture to high extent due to which they faced posture related problems.

4.5 Testing of Hypotheses

Several hypotheses were formulated to find out the relationship between selected variables of the present study. In the present investigation, as per the nature of variables t-test, Coefficient of Correlation and Analysis of the Variance (ANOVA) were computed. For the purpose of statistical analysis, the hypotheses were formulated in null form. The results are presented in this section:

H_{o1}: There exists no relationship between selected physical problems faced by youth due to usage of laptop/computer and selected personal, family and situational variables

This broad hypothesis was made into several specific hypotheses.

$H_{o1.1}$: There exists no difference between selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer and selected personal variable viz. Gender and situational variable viz. Extent of usage of laptop/computer

To study the difference between selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer and selected personal variable viz. gender and situational variable viz. Extent of usage of laptop/computer, t-test was computed.

Table 25: t-test showing difference in the physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer with selected personal variable viz. Gender and situational variable viz. Extent of usage of laptop/computer

Sr. No.	Selected Variables	Mean score	t-value	df	Level of significance
1.	**Gender**				
	Musculoskeletal discomfort (faced during last 12 months)				
	Male	3.57	.636	118	N.S
	Female	3.30	.625	104.152	
	Vision Problems (faced during last 12 months)				
	Male	2.81	-2.776	118	N.S
	Female	4.11	-2.738	106.052	
	Posture related Problems				
	Male	36.46	-1.052	118	N.S
	Female	37.23	-1.027	99.306	
2.	**Extent of usage of laptop/computer**				
	Musculoskeletal discomfort (faced during last 12 months)				
	One Year	4.00	2.020	118	N.S
	More than one year	3.12	1.979	79.306	
	Vision Problems (faced during last 12 months)				
	One Year	3.50	-.077	118	N.S
	More than one year	3.54	-.080	93.109	
	Posture related Problems				
	One Year	36.67	-.438	118	N.S
	More than one year	37.00	-.422	75.336	

Notes: df = Degree of Freedom, N.S = Not Significant

The computation of t-value depicted that there is no significant difference in the physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer with selected personal variable (Gender) and situational variable (Extent of usage of laptop/computer). Hence, the null hypothesis was accepted **(Table 25).**

$H_{o1.2}$: There exists no variation in the selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer with selected personal variables viz. Age (in years), Education qualification, Employment Status, and family variable viz. Family monthly income (in rupees)

Analysis of Variance (ANOVA) was computed to test the hypothesis.

Table 26: Analysis of Variance showing variation in the selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer with selected personal variables viz. Age (in years), Education qualification, Employment Status, and family variable viz. Family monthly income (in rupees)

Sr. No.	Selected Variables	df	Sum of Squares	Mean Squares	F-value	Level of Significance
1.	**Age (in years)**					
	Musculoskeletal discomfort (faced during last 12 months)					
	Between groups	4	3.836	.959	0.174	N.S
	Within groups	115	635.489	5.526		
	Vision Problems (faced during last 12 months)					
	Between groups	4	25.535	6.384	0.938	N.S
	Within groups	115	782.390	6.803		
	Posture related Problems					
	Between groups	4	98.929	24.732	1.609	N.S
	Within groups	115	1767.438	15.369		
2.	**Educational Qualification**					
	Musculoskeletal discomfort (faced during last 12 months)					
	Between groups	4	17.764	4.441	0.822	N.S
	Within groups	115	621.561	5.405		
	Vision Problems (faced during last 12 months)					
	Between groups	4	7.573	1.893	0.272	N.S
	Within groups	115	800.352	6.960		
	Posture related Problems					
	Between groups	4	53.732	13.433	0.852	N.S
	Within groups	115	1812.367	15.762		

3.	**Employment Status**					
	Musculoskeletal discomfort (faced during last 12 months)					
	Between groups	2	10.717	5.359	0.997	N.S
	Within groups	117	628.608	5.373		
	Vision Problems (faced during last 12 months)					
	Between groups	2	18.343	9.171	0.1359	N.S
	Within groups	117	789.582	6.749		
	Posture related Problems					
	Between groups	2	25.884	12.942	0.823	N.S
	Within groups	117	1840.483	15.731		
4.	**Family Monthly Income (in rupees)**					
	Musculoskeletal discomfort (faced during last 12 months)					
	Between groups	4	46.281	11.570	2.244	N.S
	Within groups	115	593.044	5.157		
	Vision Problems (faced during last 12 months)					
	Between groups	4	14.619	3.655	0.530	N.S
	Within groups	115	739.306	6.898		
	Posture related Problems					
	Between groups	4	137.969	34.492	2.295	N.S
	Within groups	115	1728.398	15.030		

Notes: df = Degree of Freedom, N.S = Not Significant

The computation of F- value showed no significant variation in the selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems with selected personal variables viz. Age (in years), Education qualification, Employment Status, and family variable viz. Family monthly income (in rupees). Hence, the null hypothesis was accepted **(Table 26).**

Ho1.3: There exists no variation in the selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer with selected situational variable viz. Amount of time spent in a day by the youth on laptop/computer

Analysis of Variance (ANOVA) was computed to test the hypothesis.

Table 27: Analysis of Variance showing variation in the selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer with selected situational variable viz. Amount of time spent in a day by the youth on laptop/computer (viz. spending time in a day on the laptop/computer (in hours) and frequency of using laptop/computer during the day)

Sr. No.	Selected Variables	df	Sum of Squares	Mean Squares	F-value	Level of Significance
1.	**Spending time in a day on the laptop/computer (in hours)**					
	Musculoskeletal discomfort (faced during last 12 months)					
	Between Groups	4	29.705	7.426	1.401	N.S
	Within Groups	115	609.620	5.301		
	Vision Problem (faced during last 12 months)					
	Between Groups	4	22.259	5.565	0.815	N.S
	Within Groups	115	785.666	6.832		
	Posture related Problem					
	Between Groups	4	130.913	32.728	2.169	N.S
	Within Groups	115	1735.453	15.091		
2.	**Frequency of using laptop/computer during the day**					
	Musculoskeletal discomfort (faced during last 12 months)					
	Between Groups	4	81.765	20.441	4.216	N.S
	Within Groups	115	557.560	4.848		
	Vision Problem (faced during last 12 months)					
	Between Groups	4	23.287	5.822	0.853	N.S
	Within Groups	115	784.638	6.823		
	Posture related Problem					
	Between Groups	4	79.948	19.987	1.287	N.S
	Within Groups	115	1786.418	15.534		

Notes: df = Degree of Freedom, N.S = Not Significant

The computation of F- value showed no significant variation in the selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems with selected situational variable viz. Amount of time spent in a day by the youth on laptop/computer (viz. spending time in a day on the laptop/computer [in hours] and Frequency of using laptop/computer during the day). Hence, the null hypothesis was accepted **(Table 27).**

Ho1.4: There exists no variation in the selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer with selected situational variable viz. Reasons for usage of laptop/computer by the youth

Analysis of Variance (ANOVA) was computed to test the hypotheses.

Table 28: Analysis of Variance showing variation in the selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer with selected situational variable viz. Reasons for usage of laptop/computer by the youth (viz. study, communication, entertainment and office work)

Sr. No.	Selected Variables	df	Sum of Squares	Mean of Squares	F-value	Level of Significance
1.	**Study**					
	Musculoskeletal discomfort (faced during last 12 months)					
	Between Groups	2	83.810	41.905	8.826	0.001
	Within Groups	117	555.515	4.748		
	Vision Problem (faced during last 12 months)					
	Between Groups	2	5.734	2.867	0.418	N.S
	Within Groups	117	802.191	6.856		
	Posture related Problem					
	Between Groups	2	253.756	126.878	9.205	0.001
	Within Groups	117	1612.610	13.783		

2.	**Communication**					
	Musculoskeletal discomfort (faced during last 12 months)					
	Between Groups	2	43.595	21.797	4.281	N.S
	Within Groups	117	595.730	5.092		
	Vision Problem (faced during last 12 months)					
	Between Groups	2	44.668	22.334	3.424	N.S
	Within Groups	117	763.257	6.524		
	Posture related Problem					
	Between Groups	2	186.190	93.095	6.483	N.S
	Within Groups	117	1680.176	14.360		
3.	**Entertainment**					
	Musculoskeletal discomfort (faced during last 12 months)					
	Between Groups	2	60.277	30.139	6.090	N.S
	Within Groups	117	579.049	4.949		
	Vision Problem (faced during last 12 months)					
	Between Groups	2	75.041	37.520	5.990	N.S
	Within Groups	117	732.884	6.264		
	Posture related Problem					
	Between Groups	2	135.093	67.547	4.565	N.S
	Within Groups	117	1731.273	14.797		
4.	**Office Work**					
	Musculoskeletal discomfort (faced during last 12 months)					
	Between Groups	2	13.197	6.599	1.233	N.S
	Within Groups	117	626.128	5.352		
	Vision Problem (faced during last 12 months)					
	Between Groups	2	16.765	8.382	1.240	N.S
	Within Groups	117	791.160	6.762		
	Posture related Problem					
	Between Groups	2	69.381	34.690	2.259	N.S
	Within Groups	117	1796.986	15.359		

Notes: df = Degree of Freedom, N.S = Not Significant

The computation of F- value showed significant variation in the selected physical problems viz. musculoskeletal discomfort (faced during last 12 months) and posture related problems with situational variable viz. study at 0.001 level of significance. The F- value was not found significant for situation variable viz. study viz. Vision Problem (faced during last 12 months). Further, the computation of F-value did not reveal any significance variation for the other situational variables **(Table 28)**. Hence, the null hypothesis was partially accepted.

Table 29: Scheffe's test showing difference between selected physical problems viz. musculoskeletal discomfort, and posture related problems faced by youth due to usage of laptop/computer with selected situational variable viz. Reasons for usage of laptop/computer by the youth (viz. study)

Sr. No.	Selected Variable	df	Mean	Level of Significance
1.	**Study**			
	Musculoskeletal discomfort (faced during last 12 months)			
	High Extent	119	3.155*	0.001
	Some Extent		-0.660	
	Low Extent		-2.495*	
	Posture related Problems			
	Hight Extent	119	-5.449*	0.001
	Some Extent		5.537*	
	Low Extent		-0.087*	

Notes: df = Degree of Freedom

The scheffe's test results revealed that the respondents who used laptop/computer for study to high extent differed significantly from those respondents who used laptop/computer for study to some extent and to low extent respectively **(Table 29)**. Hence it was concluded based on mean score that the respondents who used laptop/computer for study To High Extent had faced a high extent of musculoskeletal discomfort (during last 12 months).

With regards to the posture related problems the data further revealed that the respondents who used laptop/computer for study to some extent were differed significantly from those respondents who were used laptop/computer for study to high extent and to low extent **(Table 29)**. Hence it was concluded based on mean score that the respondents who used laptop/computer for study to some extent had faced a high extent of posture related problems.

H_{o2}: There exists no relationship between the musculoskeletal discomfort faced by the youth during last 12 months and Posture related problems.

Co-efficient or correlation was computed to find out relationship between the musculoskeletal discomfort faced by the youth during last 12 months and posture related problems**.**

Table 30: Co-efficient of correlation showing relationship between the musculoskeletal discomfort faced by the youth during last 12 months and posture related problems

Selected Variables	N	r- value	Level of significance
Musculoskeletal discomfort (faced during last 12 months)	120	-0.371**	0.001
Posture related problems			

The result revealed that their existed significant relationship between the musculoskeletal discomfort faced by the youth during last 12 months with posture related problems faced at 0.001 level of significance. Hence, the null hypothesis was rejected **(Table 30).** It can be concluded that greater the musculoskeletal discomfort faced by the youth during last 12 months more was posture related problems faced by them.

H_{o3}: There exists no relationship between the vision problems faced by youth during last 12 months and posture related problems.

Co-efficient of correlation was computed to find out relationship between the vision problems faced by youth during last 12 months and posture related problems.

Table 31: Co-efficient of correlation showing relationship between the vision problems faced by youth during last 12 months and posture related problems

Selected Variables	N	r- value	Level of significance
Vision problems (faced during last 12 months)	120	-0.145	N.S
Posture related problem			

Notes: *N.S = Not Significant

The co-efficient of correlation was not found significant for vision problems faced by youth during last 12 months and posture related problems faced. Hence, the null hypothesis was accepted **(Table 31).**

Conclusion

For the present study, the data were collected regarding personal, family and situational information of the respondents. It was found that 43.33 per cent of the respondents were in the age group of 21 to 22 years. Less than one-half (45.00%) of the respondents were males and more than one-half (55.00%) of the respondents were females. Majority of the data revealed that Less than one-half (46.67%) of the respondents were Graduates. Majority of the respondents i.e. (65.00%) Less than two-third of the respondents were unemployed. It was found that 97.50 per cent of the respondents were of the height ranging between 162-205cms. Majority (50%) of the respondents had weight between 50 to 67 kg. More than one-half (55.00%) of the respondents belonged to nuclear family. It was found that 64.17 per cent of the respondents were living with 4-5 members in the family. The findings reflected that 27.50 per cent of the respondent's total monthly family income was between 10,000 to 20,000 rupees. 65.00 per cent of the respondents were using laptop/computer since more than one year and 35.00 per cent of the respondents were using laptop/computer for one year.

It was found that majority of respondents possess laptop and only 13.33 per cent of the respondents possess computer. It was found thar majority (97.50%) of respondents possessed knowledge for using laptop/computer. It was revealed that majority of respondents had spent 1-2 hours in a day on the laptop/computer. Further, majority (55.83%) of the respondents used laptop/computer more frequently in afternoon in a day.

For the reasons for usage of laptop/computer by the youth, it was revealed that majority of the respondents used laptop/computer for study and entertainment purpose. It was revealed that 63.33 per cent of the respondents used laptop/computer for searching online for information and learning about a topic they were interested into a high extent for the reason of study. It was found that 40.83 per cent of the respondents used laptop/computer for sending and reading emails to a high extent for the reason of communication. It was found that 43.33 per cent of the respondents used laptop/computer for going live to a high extent

for the reason of entertainment. It was found that more than one-fourth (29.17%) of the respondents were using laptop/computer for making online transactions related to work to a high extent for the reason of office work.

After analyzing overall data regarding physical problems viz. musculoskeletal discomfort, vision problems and posture related problems respondents faced due to usage of laptop/computer. It was revealed that musculoskeletal discomfort respondents faced in their neck, lower back, shoulder and upper back during last 12 months and since last 7 days majority of the respondents faced musculoskeletal discomfort in their neck, lower back and upper back. It was reflected that majority of the respondents faced musculoskeletal discomfort in their neck and lower back which prevented them from carrying out their normal activities during last 12months. Further, the respondents experienced musculoskeletal discomfort during last 12months in their neck, lower back due to which they had consulted a physician. It was found that the respondents faced vision problems like headache, back pain, tiredness, eyestrain and eye irritation during last 12 months and since last 7days majority of respondents faced vision problems like headache, tiredness, blurred vision and dry eyes. It was found that the respondents faced vision problems like headache, back pain and blurred vision while operating laptop/computer which prevented them from carrying out their normal activities. Further, the respondents faced vision problems like headache and tiredness during last 12months due to which consulted an ophthalmologist. It was found that the respondents were sitting for long hours in one position, sitting with lifted shoulder for more than 2hour, kept their head twisted towards the left and right while operating laptop/computer due to which respondents faced posture related problems.

A significant relationship was found between the musculoskeletal discomfort faced by the youth during last 12 months and posture related problems faced by youth due to usage of laptop/computer at 0.001 level of significance. Therefore, it can be concluded that greater, the discomfort faced by the youth during last 12 months more were posture related problems faced. A significant relationship was

found between selected physical problems viz. musculoskeletal discomfort (faced during last 12 months) and posture related problems with situational variable viz. study at 0.001 level of significance. Therefore, it can be concluded that youth more used laptop/computer for the reason of study faced more selected physical problems viz. musculoskeletal discomfort (during last 12 months) and posture related problems.

Summary and Conclusion

CHAPTER – V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Youth is best understood as a period of transition from the dependence of childhood to adulthood's independence. The United Nations, for statistical purposes, defines 'youth', as those persons between the ages of 15 and 24 years, without prejudice to other definitions by Member States. Technology and gadgets are now indispensable in the daily lives of youth today. Technology helps advance humans forward by doing mundane things that are more efficient and repeatable. Technology has brought about a great change in the field of information revolution. Gadgets equipped with internet have transformed the lives of youth in several ways and brought about a paradigm shift in our dependence on technology to perform key tasks in our everyday routine. Statistics from the United States suggest that young people spend on an average 7 hours and 38 minutes per day engaging with media content. There are several reasons for usage of laptop/computer by the youth viz. study, communication, entertainment and office work. Common uses for the laptop/computer by the youth include taking notes or researching papers, presenting information in business meetings, accessing data away from home or the office, playing games or watching movies while travelling, accessing the internet in a public place, sending and receiving email in public place.

Youth spend a couple of hours a day in front of a computer without thinking about the impact on their physical health. The nature of working with laptop/computer in one hand and not paying attention to occupational health and their ergonomics principles during the work and prolong time spent with the computer, on the other hand, have led to the high prevalence and serious musculoskeletal disorders(MSDs) in computer and laptop users. MSDs can affect many different parts of the body including upper and lower back, neck, shoulders and extremities (arm, hands, thighs, knees and feet). This musculoskeletal discomforts in several body parts are interconnected with adaptation of posture while using laptop/computer. A good posture creates less stress on the joints,

requires less muscle activity to maintain balance and, therefore, is the position of maximum effectiveness. An imbalanced posture must be compensated by changes in joint positions which, in turn, must be maintained by an increase in muscle activity, leading to injuries. Postural imbalance results in increased energy consumption. Prolonged usage in faulty posture have created various musculoskeletal problems. There was a positive correlation between the posture adopted and the incidence of pain. They may develop vision problems such as headaches, tiredness, eyestrain, blurred vision, double vision, dry eyes, back pain, red eyes.

Various studies found while collecting review of literature focused on musculoskeletal disorder, prevalence of dry eyes, health issues managements and computer users, musculoskeletal problems, musculoskeletal pain, musculoskeletal discomfort, vision syndrome, awareness of good posture and computer ergonomics.

Subjects such as “Ergonomics” is offered by the Department of Family and Community Resource Management, Faculty of Family and Community Sciences, Maharaja Sayajirao University of Baroda at Post Graduation level. The findings of the present research will help to the students of Family and Community Resource Management to gain information related to adopted awkward postures which results in physical fatigue and its effect on the body. This study will be beneficial to enhance the knowledge of practicing Architects, Interior Designers and Builders to design an ergonomically sound workplace. This study on selected physical problem due to usage of laptop/computer would offer the best hope for common users of laptop/computer to identify the problems, take necessary steps to minimize computer related physical problems, reduce the cost and injuries associated with ergonomics hazards of computer usages.

Statement of Problem

The present research study aims to assess the extent of selected Physical problems viz musculoskeletal discomfort, posture related problem and vision problem faced by youth due to usage of Laptop/Computer**.**

Objectives of the Study

1. To study the demographic characteristics of the youth.
2. To determine the amount of time spent in a day by the youth on laptop/computer.
3. To know the reasons for usage of laptop/computer by the youth.
4. To assess the extent of selected physical problems viz musculoskeletal discomfort, vision problems and posture related problem faced by youth due to usage of laptop/computer.

Delimitation

1. The study was limited to youth who had been using laptop/computer during last twelve months from the time of data collection.
2. The study was limited to youth who had been in the age group of 15 to 24 years.
3. The study was limited to youth who had not been differently abled.

Hypotheses of the study

1. There exists a relationship between selected physical problems faced by youth due to usage of laptop/computer and selected personal, family and situational variables.
2. There exists a relationship between the musculoskeletal discomfort faced by the youth during last 12 months and posture related problems.
3. There exists a relationship between the vision problems faced by youth during last 12 months and posture related problems.

Methodology

The research design for the present investigation was descriptive in nature. The samples for the present study was selected from Vadodara city through Convenience sampling technique. The data was collected from 120 respondents who were in the age group from Fifteen years to Twenty-Four years and using laptop/computer since last 12 months. For the present study data collection tool was developed namely Questionnaire (in the google form).

The four sections were comprised in questionnaire for the present study. Section one comprised background information of the respondents. This section contained questions regarding the personal information of the respondents covering details on their age (in year), gender, height (in cm), weight (in kg), educational qualification, employment status. Family Information of the respondents included details on their family type, number of family members, and total monthly family income (in rupees). Situational information of the respondents included detail on extent of usage of laptop/computer by the youth. Section two contained questions regarding the amount of time spent in a day by the youth on laptop/computer. Section three contained questions regarding the reasons given by the youth for using laptop/computer viz. study, communication, entertainment and office work. Section four contained questions regarding selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems. Modified version of the standardized questionnaire namely" Nordic musculoskeletal Questionnaire" was used to study the musculoskeletal discomfort faced by the youth while using laptop/computer during last 12 months and 7 days respectively. The scale also consisted of statements regarding the discomforts that prevented them in carrying out normal activities during last 12 months and consulted a physician for this condition during last 12 months. This were asked for different body parts viz. neck, shoulder, upper back, elbows, wrists/hands, lower back, hips/thighs, knees, ankles/feet. To study the vision problems, this part included items pertaining to the vision problems viz.

headache, tiredness, eyestrain, blurred vision, Double vision, red eyes, eye irritation, dry eyes, back pain faced by the youth while using laptop/computer during last 7 days and 12 months respectively. The scale also consisted of statements regarding the vision problems that prevented them in carrying out normal activities during last 12 months and consulted an ophthalmologist for this condition during last 12 months. To study the posture related problems a scale comprising of 18 statements of various postures adopted during the usage of laptop/computer which were good posture as well as poor posture was prepared.

Validity and reliability was established for the scale's reasons for usage of laptop/computer by the youth, vision problems and posture related problems through pretesting. To test the content validity of the scale's it was given to the panel of eleven judges who were academicians from the Department of Family and Community Resource Management, Faculty of Family and Community Science, The Maharaja Sayajirao University of Baroda, Vadodara. The reliability of the scale was established through split-half method of establishing reliability. The Cronbach's alpha test had been applied on random of 30 samples. The reliability values found was 0.773 for reasons for usage of laptop/computer by the youth, for vision problems reliability value found was 0.946 and for posture related problems reliability value found was 0.820. The data was analyzed using descriptive as well as relational statistics. The descriptive analysis like frequency, percentage, mean and standard deviation, were used to analyze the data. Relational statistics like 'F-Ratio' (ANOVA), t-test and Co-efficient of Correlation were applied to test the hypotheses postulated for the study.

Major Findings

The major findings of the study are presented here.

Section 1: Background Information

- **Personal information:** It was found that 43.33 per cent of the respondents were in the age group of 21 to 22 years. Less than one-half (45.00%) of the respondents were males and more than one-half (55.00%) of the respondents

were females. Majority of the data revealed that Less than one-half (46.67%) of the respondents were Graduates, one-fourth (25.00%) of the respondents were 12th pass. Less than two-third (65.00%) of the respondents were unemployed. It was found that 97.50 per cent of the respondents were of the height ranging between 162-205cms. Majority (50%) of the respondents had weight between 50 to 67 kg.

- **Family Information:** More than one-half (55.00%) of the respondents belonged to nuclear family. It was found that 64.17 per cent of the respondents were living with 4-5 members in the family. The findings reflected that 27.50 per cent of the respondent's total monthly family income was between 10,000 to 20,000 rupees.
- **Situational Information:** 65.00 per cent of the respondents were using laptop/computer since more than one year and 35.00 per cent of the respondents were using laptop/computer for one year.

Section 2: Amount of time spent in a day by the youth on laptop/computer: It was found that majority of respondents possess laptop and only 13.33 per cent of the respondents possess computer. It was found thar majority (97.50%) of respondents possessed knowledge for using laptop/computer. It was revealed that majority (33.33%) of respondents had spent 1-2 hours in a day on the laptop/computer. Further, majority (55.83%) of the respondents used laptop/computer more frequently in afternoon in a day.

Section 3: Reasons for usage of laptop/computer by the youth: It was found that 48.72 per cent of the respondents used laptop/computer for study purpose, whereas Less than one-fourth (24.62%) of the respondents used laptop/computer for entertainment. The data revealed that 63.33 per cent of the respondents used laptop/computer for searching online for information and learning about a topic they were interested into a high extent. The findings on the weighted mean scores for study as one of the reason for using laptop/computer was found high for reasons like searching online for information and learning about a topic interested in (2.58), downloading uploading or browse learning

material for school/college's related work (2.43) and using Word, Excel, Power Point (2.38). It was found that 40.83 per cent of the respondents used laptop/computer for sending and reading emails to a high extent. The mean weighted scores for communication as one of the reasons for using laptop/computer was found high for specific reasons like sending and reading emails (2.25), attending meetings (2.11) and making new friends through social networking sites (1.96). It was found that 43.33 per cent of the respondents used laptop/computer for going live to a high extent. The findings on the weighted mean scores for entertainment as one of the reasons for using laptop/computer was found high for reasons like going live (2.34), browsing the internet for fun (e.g. watching video clips, download music, using social media) (2.26) and (2.14) for searching online for practical information (e.g. seats at a match, concert, movie, shopping, train times, health) and playing games**.** It was found that more than one-fourth (29.17%) of the respondents were using laptop/computer for making online transactions related to work to a high extent. The weighted mean scores for office work as one of the reasons for using laptop/computer were found high for reasons like making online transactions related to work (1.95) and attending meetings, workshops and conferences (1.82).

Section 4: Extent of selected physical problems faced by youth due to usage of laptop/computer

After analyzing overall data regarding physical problems viz. musculoskeletal discomfort, vision problems and posture related problems respondents faced due to usage of laptop/computer.

Musculoskeletal Discomfort: It was found that majority 66.67 per cent of the respondents faced discomfort in neck during last 12 months. More than one-half (52.50%) of the respondents faced discomfort in lower back during last 12 months. Majority 47.50 per cent of the respondents faced discomfort in neck since last 7 days. More than one-fourth (35%) of the respondents faced discomfort in lower back since last 7 days. It was revealed that 45 per cent of the respondents faced discomfort in neck during last 12months which prevented

them from carrying out their normal activities, whereas 37.50 per cent of the respondents faced discomfort in lower back. It was found that during last 12 months majority 20.83 per cent of the respondents faced discomfort in neck due to which they had consulted a physician.

Vision Problems: It was found that less than three fourth (70%) of the respondents faced headache during last 12 months. More than one half (51.67) of the respondents faced back pain during last 12 months. Moreover 40.83 per cent of the respondents faced eyestrain and eye irritation during last 12 months. It was found that less than one half (43.33%) of the respondents faced headache since last 7 days. Less than one half (42.50%) of the respondents faced tiredness since last 7 days. It was found that more than one half (51.67%) of the respondent faced headache during last 12months which prevented youth from carrying out their normal activities. Less than one half (42.50%) of the respondents faced back pain during last 12 month which prevented youth from carrying out their normal activities. It was found that 33.33 per cent of the respondents faced headache during last 12 months due to which consulted an ophthalmologist. More than one fourth (26.67%) of the respondents faced tiredness during last 12 months due to which consulted an ophthalmologist.

Posture related Problems: The findings in revealed that 39.17 per cent of the respondents were sitting for long hours in one position while operating laptop/computer. Less than one-fourth (24.17%) of the respondents Sitting with lifted shoulder for more than 2hour while operating laptop/computer. The findings related to weighted mean scores found high for sitting for long hours in one position while operating laptop/computer (2.25), Sitting with lifted shoulder for more than 2hour while operating laptop/computer (2.15).

Testing of Hypothesis:

- A significant relationship was found between the musculoskeletal discomfort faced by the youth during last 12months and posture related problems faced by youth due to usage of laptop/computer at .001 level of significance.

- A significant relationship was found between selected physical problems viz. musculoskeletal discomfort (faced during last 12 months) and posture related problems with situational variable viz. study at .001 level of significance.

Conclusion

The data were collected regarding personal, family and situational information of the respondents. It was found that 43.33 per cent of the respondents were in the age group of 21 to 22 years. Less than one-half (45.00%) of the respondents were males and more than one-half (55.00%) of the respondents were females. Majority of the data revealed that Less than one-half (46.67%) of the respondents were Graduates. Majority of the respondents i.e. (65.00%) Less than two-third of the respondents were unemployed. It was found that 97.50 per cent of the respondents were of the height ranging between 162-205cms. Majority (50%) of the respondents had weight between 50 to 67 kg. More than one-half (55.00%) of the respondents belonged to nuclear family. It was found that 64.17 per cent of the respondents were living with 4-5 members in the family. The findings reflected that 27.50 per cent of the respondent's total monthly family income was between 10,000 to 20,000 rupees. 65.00 per cent of the respondents were using laptop/computer since more than one year and 35.00 per cent of the respondents were using laptop/computer for one year.

It was found that majority of respondents possess laptop and only 13.33 per cent of the respondents possess computer. It was found thar majority (97.50%) of respondents possessed knowledge for using laptop/computer. It was revealed that majority of respondents had spent 1-2 hours in a day on the laptop/computer. Further, majority (55.83%) of the respondents used laptop/computer more frequently in afternoon in a day.

For the reasons for usage of laptop/computer by the youth, it was revealed that majority of the respondents used laptop/computer for study and entertainment purpose. It was revealed that 63.33 per cent of the respondents used laptop/computer for searching online for information and learning about a topic

they were interested into a high extent for the reason of study. It was found that 40.83 per cent of the respondents used laptop/computer for sending and reading emails to a high extent for the reason of communication. It was found that 43.33 per cent of the respondents used laptop/computer for going live to a high extent for the reason of entertainment. It was found that more than one-fourth (29.17%) of the respondents were using laptop/computer for making online transactions related to work to a high extent for the reason of office work.

After analyzing overall data regarding physical problems viz. musculoskeletal discomfort, vision problems and posture related problems respondents faced due to usage of laptop/computer. It was revealed that musculoskeletal discomfort respondents faced in their neck, lower back, shoulder and upper back during last 12 months and since last 7 days majority of the respondents faced musculoskeletal discomfort in their neck, lower back and upper back. It was reflected that majority of the respondents faced musculoskeletal discomfort in their neck and lower back which prevented them from carrying out their normal activities during last 12months. Further, the respondents experienced musculoskeletal discomfort during last 12months in their neck, lower back due to which they had consulted a physician. It was found that the respondents faced vision problems like headache, back pain, tiredness, eyestrain and eye irritation during last 12 months and since last 7days majority of respondents faced vision problems like headache, tiredness, blurred vision and dry eyes. It was found that the respondents faced vision problems like headache, back pain and blurred vision while operating laptop/computer which prevented them from carrying out their normal activities. Further, the respondents faced vision problems like headache and tiredness during last 12months due to which consulted an ophthalmologist. It was found that the respondents were sitting for long hours in one position, sitting with lifted shoulder for more than 2hour, kept their head twisted towards the left and right while operating laptop/computer due to which they faced posture related problems.

A significant relationship was found between the musculoskeletal discomfort faced by the youth during last 12months and posture related problems faced by youth due to usage of laptop/computer at 0.001 level of significance. Therefore, it can be concluded that greater, the discomfort faced by the youth during last 12months more were posture related problems faced. A significant relationship was found between selected physical problems viz. musculoskeletal discomfort (faced during last 12 months) and posture related problems with situational variable viz. study at 0.001 level of significance. Therefore, it can be concluded that youth more used laptop/computer for the reason of study faced more selected physical problems viz. musculoskeletal discomfort (during last 12 months) and posture related problems.

Implication of the Study

The findings of the present study had the following implications:

For the Youth

The findings of the present study will be helpful to the youth to know about which musculoskeletal discomfort and vision problems they face majorly, due to long time usage of laptop/computer. The findings will be helpful to reduce that pain and discomfort while using laptop/computer.

For the Government

The findings of the present study can be helpful to the government to develop guidelines and policies to reduce physical problems due to usage of laptop/computer.

For the professionals, government employees and academicians

The findings of the present study can be helpful to the professionals, government employees and academicians, office workers, call center workers who have to work continuously on laptop/computer for long hours together to adopt good

postures which can reduce their strain and pain in different body parts which would enhance their productivity.

For the Interior Designers and Architectures

The findings of the present study can be helpful for interior designers and architectures to design ergonomically sound workplace and objects which can helpful to reduce musculoskeletal and vision problems.

For the Field of Family and Community Resource Management

The findings of the present study can be helpful to the students from the field of family and community resource management as it offers a course named “Interior Designing” and “Ergonomics”. Students can know about different musculoskeletal and vision problems as well as body postures. It can also helpful for interior designing students to keep in mind about musculoskeletal problems while designing furniture objects like chair, computer desk, office table etc. accordingly.

Recommendations for the future studies

1. Researcher can undertake similar type of in other cities of Gujrat or different states in India.
2. A study can also be conducted on comparison of other types of digital devices like tablets, smart phones etc.
3. A similar study can be conducted on a larger sample size.
4. A systematic comparative study between male and female workers can be conducted between posture adopted and musculoskeletal disorder prevalent among the laptop/computer users.
5. Further research can also be undertaken on other group of respondents like professionals working in different fields.

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Appendix

APPENDIX

A STUDY TO ASSESS THE EXTENT OF SELECTED PHYSICAL PROBLEMS FACED BY YOUTH DUE TO USAGE OF LAPTOP/COMPUTER

Section 1: Background information of the respondents

(A) Personal Information

1. Name of Respondent: _____
2. Age (in years):
   - 15-16 years
   - 17-18 years
   - 19-20 years
   - 21-22 years
   - 23-24 years
3. Gender:
   - Male
   - Female
4. Educational Qualification of the respondent
   - 10^{th} Pass
   - 12^{th} Pass
   - Diploma
   - Graduate
   - Postgraduate
5. Employment Status:
   - Employed
   - Unemployed
   - Self Employed
6. Height (in cms): _____
7. Weight (in kg): _____

(B) Family Information

1. Type of Family:
   - Joint
   - Nuclear
2. Number of Family Members:
   - 2-3 Members
   - 4-5 Members
   - 6-7 Members
   - 8 or more
3. Total Monthly Family Income (in rupees):
   - ₹10,000 - ₹20,000
   - ₹20,000 - ₹30,000
   - ₹30,000 - ₹40,000
   - ₹40,000 - ₹50,000
   - More than ₹50,000

(C) 1. Extent of usage of Laptop/Computer:
   - One year
   - More than One year

Section2: Amount of time spent in a day by the youth on laptop/computer.

Kindly (✔) mark on the appropriate answer for using Laptop/Computer.

1. Do you possessing a laptop/computer to use?
   - Laptop
   - Computer
2. Do you have knowledge of using laptop/computer?
   - Yes
   - No
3. In a day how much time do you spend on the laptop/computer?
   - Less than 60 minutes

- 1-2 hours
- 2-4 hours
- 4-6 hours
- Above 6 hours

4. Which time of the day do you use the laptop/computer more frequently?
   - Morning
   - Afternoon
   - Evening
   - Night

Section 3: Reasons for usage of laptop/computer by the youth.

Kindly (✔) mark on the appropriate reasons for using Laptop/Computer.

1. What are the main reasons of using laptop/computer?
   - Study
   - Communication
   - Entertainment
   - Office work
2. Kindly (✔) tick mark on the appropriate reasons for using laptop/computer.

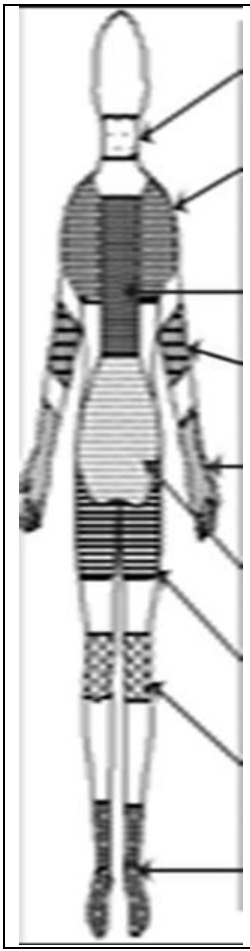
Reasons for using Laptop/Computer	**To High Extent**	**To Some Extent**	**To Low Extent**
A. Study			
1. Using an online dictionary or encyclopedia.			
2. Searching online for information and learning about a topic interested in.			
3. Learning about educational software, games and quizzes.			
4. Using word, Excel, Power point.			
5. Attending online classes and			

webinar.			
6. Participate in online learning programs			
7. Download, upload or browse learning material for school/college's related work.			
8. Check the school/college website for announcements, dates, circulars etc.			
B. Communication			
1. Making new friends through social networking sites.			
2. Taking part in online group discussion or forum			
3. Sending and reading emails.			
4. Attending meetings.			
C. Entertainment			
1. Reading or writing the news online.			
2. Searching online for practical information (e.g. seats at a match, concert, movie, shopping, train times, health).			
3. Playing games.			
4. Browsing the internet for fun (e.g. watching video clips, download music, using social media).			
5. Going Live			
D. Office work			
1. Marketing products.			
2. Data typing work.			
3. Programming.			
4. Attending meeting's, workshops and conferences.			
5. Making online Transactions related to work			

Section 4: Extent of selected Physical problems faced by youth due to usage of laptop/computer.

Please answer by putting a cross in the appropriate box_ one cross for each question. Please answer every question even if you have never had trouble in any parts of your body. This picture shows how the body has been divided. You should decide for yourself which part (if any) is or has been affected.

A. MUSCULOSKELETAL DISCOMFORT

		Have you at any time during the last 12 months had trouble (such as ache, pain, discomfort, numbness) in:	During the last 12 months have you been prevented from carrying out normal activities (e.g. job, housework, hobbies) because of this trouble in:	During the last 12 months have you seen a physician for this condition:	During the last 7 days you had trouble in:
	**NECK**	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
	SHOULDER	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
	UPPER BACK	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
	ELBOWS	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
	WRISTS/HANDS	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
	LOWER BACK	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
	HIPS/THIGHS	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
	KNEES	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
	ANKLES/FEET	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes

B. VISION PROBLEM

Kindly (✔) tick mark the on the appropriate option given below in the following statements. Which you feel while operating a laptop/computer.

Statements	**Have you at any time during the last 12months had feel:**	**During the last 12 months have you been prevented from carrying out normal activities (e.g. job, housework, hobbies) because of this :**	**During the last 12 months have you seen a Ophthalmologist for this condition:**	**During the last 7 days you had feel:**
1.Headache	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
2.Tiredness	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
3.Eyestrain	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
4.Blurred Vision	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
5.Double Vision	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
6..Red Eyes	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
7.Eye Irritation	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
8.Dry Eyes	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
9.Back pain	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

C.POSTURE RELATED PROBLEMS

(Postures adopted good as well as poor)

Kindly (✔) tick mark on the appropriate option given below in the following statements. Which posture do you adopt while operating a laptop/computer?

Sr. No	Statements	To High Extent	To Some Extent	To Low Extent
1.	Not bending or thrusting forward while operating laptop/computer.			
2.	Sitting for long hours in one position while operating laptop/computer.			
3.	Sitting with lifted shoulder for more than 2hour while operating laptop/computer.			
4.	Sitting with awkward posture (back bended) while operating laptop/computer.			
5.	Performing repetitive tasks while operating laptop/computer.			
6.	Keeping hand placed in a straight line with lower arm while operating laptop/computer.			
7.	Keeping head in a bended position while operating laptop/computer.			

8.	Keeping head twisted towards the left and right while operating laptop/computer.			
9.	Sitting on the floor and using Laptop.			
10.	Seeing the screen at an awkward angle while operating laptop/computer.			
11.	Bending wrist to use the keyboard while operating laptop/computer.			
12.	Keeping spine in a correct position while operating laptop/computer.			
13.	Taking frequent stretch breaks every 30 to 40 minutes while operating laptop/computer.			
14.	Remaining in a static posture for long periods of time while operating laptop/computer.			
15.	Tilting head while operating laptop/computer.			
16.	Keeping feet rest flat on the floor while operating laptop/computer.			
17.	Keeping thighs in parallel to the floor while operating laptop/computer.			
18.	Sitting with back support while operating laptop/computer			

Abstract

ABSTRACT

Youth is the time of life when one is young, and often means the time between childhood and adulthood (maturity). The United Nations, for statistical purposes, defines 'youth', as those persons between the ages of 15 and 24 years. The present study focuses on the youth who uses the laptop/computer. The youth spent more time on laptop/computer to do several things such as study, communication, entertainment and office work. Further they do repetitive task, adopted incorrect postures due to which they faced physical problems such as musculoskeletal discomfort, vision problems and posture related problems. Hence, the study was conducted to assess the extent of selected physical problems viz. musculoskeletal discomfort, vision problems and posture related problems faced by youth due to usage of laptop/computer. The study also aimed to study the amount of time spent in a day by the youth on laptop/computer and to know the reasons for usage of laptop/computer by the youth. The research design for the present investigation was descriptive in nature. The samples for the present study was selected from Vadodara city through Convenience sampling technique. The data was collected from 120 respondents who were in the age group from Fifteen years to Twenty-Four years and using laptop/computer since last 12 months. For the present study data collection tool was developed namely Questionnaire (in the google form). The standardized questionnaire namely, modified version of "Nordic Questionnaire" to assess the musculoskeletal discomfort. The scale's reasons for usage of laptop/computer by the youth, vision problems and posture related problems was validated by the academicians from the Department of Family and Community Resource Management, Faculty of Family and Community Science, The Maharaja Sayajirao University of Baroda, Vadodara. The reliability values found was 0.773 for reasons for usage of laptop/computer by the youth, for vision problems reliability value found was 0.946 and for posture related problems reliability value found was 0.820.

It was found that majority (33.33%) of respondents had spent 1-2 hours in a day on the laptop/computer and 55.83 per cent of the respondents used laptop/computer more frequently in afternoon in a day. It was revealed that majority of the respondents used laptop/computer for study and entertainment purpose.

After analyzing overall data regarding physical problems viz. musculoskeletal discomfort, vision problems and posture related problems respondents faced due to usage of laptop/computer. It was revealed that musculoskeletal discomfort respondents faced in their neck, lower back, shoulder and upper back during last 12 months. It was found that the respondents faced vision problems like headache, back pain, tiredness, eyestrain and eye irritation during last 12 months. It was revealed that the respondents were sitting for long hours in one position, sitting with lifted shoulder for more than 2hour, kept their head twisted towards the left and right while operating laptop/computer due to which they faced posture related problems.

A significant relationship was found between the musculoskeletal discomfort faced by the youth during last 12months and posture related problems faced by youth due to usage of laptop/computer at 0.001 level of significance. Also, a significant relationship was found between selected physical problems viz. musculoskeletal discomfort (faced during last 12 months) and posture related problems with situational variable viz. study at 0.001 level of significance.

Thus, there is need to know about body postures and related physical problems faced due to usage of laptop/computer by the youth. Findings of the present study will be helpful to the youth to know about which musculoskeletal and vision problems they face majorly, due to long time usage of laptop/computer. The findings will be helpful for them to reduce that pain and discomfort while using laptop/computer. The findings of the present study can be helpful to the government to develop guidelines and policies to reduce physical problems due

to usage of laptop/computer. The findings of the present study can be helpful to the professionals, government employees and academicians, office workers, call center workers who have to work continuously on laptop/computer for long hours together to adopt good postures which can reduce their strain and pain in different body parts which would enhance their productivity. The findings of the present study can be helpful for interior designers and architectures to design ergonomically sound workplace and objects which can helpful to reduce musculoskeletal and vision problems.