

**PREVALENCE OF POST-OPERATIVE PULMONARY
COMPLICATIONS FOLLOWING THORACIC SURGERY AT
NIDCH**

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Bachelor of Science in Physiotherapy (B. Sc. In PT)

DU Roll No: 170

Reg. No: 5258

Session: 2012-2013

BHPI, CRP, Savar , Dhaka-1343



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Bangladesh

February, 2017

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

“PREVALENCE OF POST OPERATIVE PULMONARY COMPLICATION FOLLOWING THORACIC SURGERY AT NIDCH”

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DECLARATION

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

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ACKNOWLEDGEMENT

First of all, I would like to express my gratefulness to Almighty Allah to complete this dissertation proposal in time. When I started the study I did not know whether I could complete it or not but I believe my fortune favours the brave. So I was determined to try my best to make it successful and I am most grateful to Almighty Allah.

After that I must go to my family who always inspired me and provide necessary support. I would like to pay my gratitude to my honorable supervisor, Ehsanur Rahman, Assistant Professor, Department of Physiotherapy, BHPI, CRP, Savar, Dhaka not only for his valuable suggestion and guidelines but also for his optimistic and courageous attitude that have inspired me through the project. I am thankful to my respectable sir Md. Obaidul Haque, Associate Professor & Head of the Department of Physiotherapy, BHPI, for giving me the permission of data collection and providing me excellent guidelines. I gratefully acknowledge my respected sir Mohammad Anwar Hossain, Associate Professor, BHPI & Head of the Department of Physiotherapy CRP, Savar. I am also grateful to Md. Shofiqul Islam, Assistant Professor, Department of Physiotherapy, BHPI, CRP, Savar and Mohammad Habibur Rahman, Assistant Professor, Department of Physiotherapy, BHPI, CRP, Savar and all my teachers of the Bangladesh Health Professions Institute (BHPI) for their support and guidance throughout the study.

I would like to give special thanks to the clinical practitioner at the National Institute Of Disease Of the Chest and Hospital, Mohakhali, Dhaka who helped me in all aspects of my data collection. I also pay thanks to the staffs of the BHPI library, which helps me to find out books for collecting information for the study.

I would like to thank all of the participants of the study for their willingness to participate and co-operation.

I want to express my gratitude to all concerned authorities of CRP who allowed me to conduct this dissertation. I also thankful to my classmates especially Arpon Kumar Paul and those entire individual who are directly or indirectly involve with this study.

ACRONYMS

BMRC: Bangladesh Medical and Research Council

BHPI: Bangladesh Health Professions Institute.

CRP: Centre for the Rehabilitation of the Paralysed

IRB: Institute Review Board

NIDCH: National Institute of Disease of the Chest and Hospital.

PPC: Post-Operative Pulmonary Complication.

SPSS: Statistical Package of the Social Sciences

WHO: World Health Organization

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ABSTRACT

Purpose: The purpose of the study was to find out the prevalence of post-operative pulmonary complications following thoracic surgery at NIDCH *Objectives:* To assess the post-operative pulmonary complications and their risk factors. *Methodology:* It was a cross sectional study. 50 samples were conveniently selected from National Institute of Disease of the chest and Hospital. Among them male were 68% (n=34), female were 32% (n=16). *Results:* In this study, the age range was 18-70, the mean age of the participants was 47.94 and median was 50. Standard deviation 13.85. In total 50 participants were selected. Among them 70 % (n=35) were suffering from respiratory complication, 30% (n=15) were not suffering from respiratory complications, In total 50 participants, 52% (n=26) were suffering from pneumonia. 48 % (n=24) were not suffering from pneumonia. In total 50 participants, 12% (n=6) were suffering from cancer and 88% (n=44) were not suffering from cancer, In total 50 participants, 58% (n=29) were suffering from breathless and 42% (n=21) were not suffering from breathless. Among 50 participants, 56 % (n=28) were suffering from atelectasis and 44% (n=22) were not suffering from atelectasis. In total 50 participants, cigarette smoker were 48% (n=24), cigarette nonsmoker were 52% (n=26). *Conclusion:* This study provides concept of common post-operative pulmonary complication among thoracic surgery patients. Most common post-operative respiratory complications are pneumonia, atelectasis, hemoptysis and breathlessness.

1.1 Background

A total of 230 million operations have been performed worldwide every year (Canet et al., 2010). Complications arising after surgery are responsible in increasing the use of resources and plays a very vital role for the death of the people. Especially postoperative respiratory complications do a great impact on morbidity and mortality of patients who have experienced surgery (Neto et al., 2012).

There is no standard definition of postoperative pulmonary complication. Most researcher found that postoperative pneumonia, respiratory failure and broncho spasm. After the analysis of the literature shows that other complications, such as unexplained fever, excessive bronchial secretions, productive cough, abnormal breath sounds, atelectasis or hypoxemia, may also be included incidence of post-operative pulmonary complication varies depending on the clinical treatment setting, the kind of surgery done. For all of these reasons behind the surgery, the occurrence rates of the post-operative respiratory complication ranging from 2% to 40% (Canet & Mazo, 2010).

A post-operative pulmonary complication (PPC) is defined as “any pulmonary abnormality occurring during the postoperative period and resulting in clinically significant disease or dysfunction, adversely affecting the clinical course the primary condition” (Sharafkhaneh et al., 2008) and the specific complications were defined by (Jammer et al., 2015).

Post-operative complication can be broadly defined as conditions affecting the respiratory tract that can adversely affect the clinical course of patients. Post-operative pulmonary complications include self-limited disorders that induce transient preoperative hypoxemia such as mild degrees of atelectasis, broncho spasm, or trachea bronchitis. However, postoperative pulmonary complications may also result in potentially substantial morbidity and mortality when they are. They encompass more severe atelectasis, broncho spasm, or trachea bronchitis, postoperative pneumonia (PP), empyema, pneumothorax, acute respiratory distress syndrome, pulmonary embolism or respiratory failure (Rudra & Sudipta, 2006).

Thoracic surgery impairs postoperative respiratory function resulting in a relatively high risk of developing postoperative pulmonary complications. The incidence (19.59%) is much higher than following upper (16.17%) or lower abdominal surgery (0.5%) (Miguel et al., 2003).

Eight million people suffer from respiratory disease in the UK and serious causes of respiratory disease kill one in four people in the UK and this has been established by (Scott et al., 2009).

Surgical and trauma patients invariably experience a sudden and profound systemic insult that often leads to decompensating of subclinical conditions and sets the stage for new and potentially life-threatening complications (Sawyer & Leon, 2010).

Patients undergoing abdominal and thoracic surgery are most prone to PPCs since the incidence of PPCs is inversely related to the distance of the surgical incision from the diaphragm (Rudra & Das, 2006).

Besides the type of surgery, increased number, and complexity of thoraco-abdominal surgical procedures, increasing severity of illness and age of patients undergoing surgery are all directly related to the patients' post-surgical outcomes (Hulzebos et al., 2003) and to the incidence of post-operative pulmonary complications.

Together, these strategies were successful, but this remains the only study to characterize and describe the outcome of a systematic and standardized postoperative pulmonary care program in non-ICU surgical ward patients. Other general guidelines have been proposed by the Centers for Disease Control and Prevention. Although pulmonary complications are not as well studied as cardiac complications in the postoperative setting, they are just as common following non cardiac surgery and are even more costly. It is worthwhile to identify surgical patients most at risk of postoperative pulmonary complications and take measures known to mitigate risk. This paper discusses important risk factors to identify during a preoperative pulmonary evaluation and then focuses on recent advances in strategies for reducing postoperative pulmonary complications (Qaseem et al., 2006).

Therefore, efforts to stratify the risk for PPCs and implement strategies to reduce these risks will improve patient outcomes. After describing the incidence of and risk factors for post-operative pulmonary complications, the review general preoperative evaluation and intra- and postoperative management strategies for patients with pulmonary conditions undergoing noncardiothoracic surgery. Further more, discuss specific perioperative management strategies appropriate for patients with different pulmonary complication (Smetana & Conde, 2008).

The resulting ventilation perfusion mismatch leads to increased shunt, dead space and hypoxemia. Anesthetics, analgesics and other preoperative drugs affect the central regulation of breathing, changing the neural drive of the upper airway and chest wall muscles and further contributing to PPC. Overall, the intensity and coordination of the activities of several muscle groups and the preservation of biological mechanisms in the lung are the keys to shifting the balance toward recovery rather than severe respiratory complications (Canet & Mazo, 2010).

Although the causal effect of the various factors was not studied, the limited regional and local data also indicate a high rate of postoperative pulmonary complications among surgical patients. A study conducted in Tanzania revealed that postoperative pulmonary complications accounted for 8.3% of morbidity and mortality (Denu et al., 2015).

Postoperative pulmonary complications are as prevalent as cardiac complications and contribute significantly to morbidity, mortality and length of hospital stay. Pulmonary complications may even be more likely than cardiac complications to predict long-term mortality after surgery (Qassem et al., 2006).

Post-operative pulmonary complications represent an important cause of mortality with rates as high as 25% depending on the operation and complication. Abdominal surgical patients who develop postoperative pneumonia experience a 10-fold increase in mortality over those who do not, as well as longer length of stay. In addition, PPCs increase 30-day readmission rates and may be a marker for decreased long-term survival in elderly hospitalized patients (Guimaraes et al., 2009).

Post-operative pulmonary complication is more of a financial burden than cardiovascular infectious complications after surgery, costing the United States \$3.4 billion annually. The benefit of any surgical procedure heavily influenced by the accompanying morbidity and mortality. Complications after surgery not only worsen outcomes but also prolong hospital stay and are associated with a significantly increased cost in hospital care (Fry et al., 2010).

In our country, there is no study about the incidence and risk factors for post-operative pulmonary complication. Previous international studies demonstrated that the majority of risk factors for post-operative pulmonary complication can be intervened and improved, so identifying which patients are at increased risk, we can reduce postoperative pulmonary complications. Studies have shown that pulmonary complications make the second most serious morbidity after cardiovascular event, one in four deaths occurring within a week of surgery is related to pulmonary complications (Fischer et al., 2010).

Postoperative pulmonary complications are common complications that increase morbidity and mortality rates after surgery, particularly among patients with pulmonary conditions .After a major non-cardiothoracic surgery, pulmonary complications are just as common as cardiac complications (Smetana et al., 2008).

Therefore, efforts to stratify the risk for post-operative pulmonary complications and implement strategies to reduce these risks will improve patient outcomes. After describing the incidence of and risk factors for post-operative pulmonary complications, we review general preoperative evaluation and intra- and postoperative management strategies for patients with pulmonary conditions undergoing non-cardiothoracic surgery. Furthermore, we discuss specific preoperative management strategies appropriate for patients with different pulmonary condition post-operative thrombo embolic, cardiovascular or infectious complications (Bruells & Rossaint, 2011).

Included under the heading of post-operative pulmonary complications are respiratory failure, reintubation within 48 h, weaning failure, pneumonia, atelectasis, broncho spasm, exacerbation of chronic obstructive pulmonary disease (COPD), pneumothorax, pleural effusion, and various forms of upper airway obstruction. The incidence of these complications varies between hospitals and between procedures. For example, thoracic surgery has a much higher PPC incidence (37.8%) than upper abdominal (12.2%) or peripheral (2.2%) surgery (Canet et al., 2010).

Complications and deaths are most frequent among high-risk patients, those who are older or have co morbid disease, and those who undergo major gastrointestinal or vascular surgery. Importantly, patients who develop complications but survive to hospital discharge have reduced long-term survival (Head et al., 2008).

Some estimates suggest that the incidence of post-operative pulmonary complication is anywhere between 5 and 40 % of patients following surgeries involving the abdomen (Seiler et al., 2009).

Respiratory complications account for almost half of the readmissions to critical care units and the development of pneumonia is associated with a mortality of 20% compared with 3% among patients free of pneumonia (Atkins, 2006).

Post-operative pulmonary complication represents a substantial economic burden. Hospital LOS is a standard reference point for assessing the cost of service. A study by Khan et al observed that PP in non-cardiac patients increased hospital LOS by 89% and hospital costs by 55%. A study by (Thompson et al., 2011) found that PP in abdominal surgical patients increased hospital LOS by 11 days and hospital charges by \$31,000 (year 2000 dollars). Overall, the mean increase in hospital LOS specifically attributable to PP is approximately 8 days.

A study by Linde-Zwirble et al analyzed adult elective surgery cases for 2008 from a large U.S. database of 414 hospitals (Shander et al., 2011).

Respiratory failure is a marker of ill health and predicts further complications. Postoperative respiratory failure (often defined as the need for ventilation for more than 48 hours after surgery) is an extremely morbid event. Johnson et al compared the outcomes of patients with and without respiratory failure as a complication of surgery (Johnson et al., 2007).

However, postoperative complications are a significant cause of morbidity and mortality in patients submitted to thoracic or abdominal surgeries⁴. Managing of these patients requires an understanding of the predictable changes in pulmonary physiology occurring with surgery and anesthesia as well as a knowledge of factors associated with development of postsurgical complications. The surgical procedure causes reduction of lung capacity (represented by forced vital capacity and forced expiratory volume in one second diaphragm dysfunction, impairs gas exchange, and cough and muco ciliary clearance leading to development of micro atelectasis and postoperative hypoxemia(Wright et al., 2008).

The most common pulmonary complications are atelectasis and pleural effusion, which can occur in 20 to 70% of patients, as well as pneumonia, whose frequency varies with the residence time of the oro tracheal tube, broncho spasm and lobar consolidation, present in 40% of patients, pulmonary edema, pleural effusion, pneumothorax and diaphragmatic dysfunction (Blattner, 2008).

In the event of compromised postoperative pulmonary function due to the aforementioned factors that predispose patients to develop respiratory complications, physical therapy plays an important pre and postoperative role in the treatment of patients submitted to cardiac surgery, aimed at creating more effective preventive strategies to reduce these complications (Morsch et al., 2009).

The ability to accurately predict modifiable post-operative pulmonary complication risk has become a major goal in the effort to enhance informed consent before surgery, to guide clinical decision-making in the preoperative period, and to measure the quality and safety of hospital care. Prediction is especially valuable when

implementing strategies to reduce the deleterious impact of post-operative pulmonary complications on clinical outcomes and rising healthcare costs. Essentially, the goal is to establish an algorithm that will identify at-risk patients who have a modifiable condition and would benefit from preventive interventions and more intensive monitoring (Shander et al., 2011).

Complications and deaths are most frequent among high-risk patients, those who are older or have co morbid disease, and those who undergo major gastrointestinal or vascular surgery. Importantly, patients who develop complications but survive to hospital discharge have reduced long-term survival (Khuri et al., 2005).

Postoperative pulmonary complications are relatively common and costly. Estimated to occur in 2.7% to 3.4% of patients who undergo non cardiac surgery Postoperative pulmonary complications, to be considered as such, must be related to anesthesia and/or surgery. Furthermore, the time frame must be well defined. Usually, an event is only considered as PPC if it develops within 5 to 7 days after surgery (Hwang et al., 2008).

In 2006, the American College of Physicians published a systematic review of the literature listing a number of risk factors for PPCs according to their respective levels of evidence.¹³ In recent years, that list has been expanded to include other factors found to increase the risk of post-operative pulmonary complications. The risk factors associated with post-operative pulmonary complications according to the current literature. Approximately 50% of the risk factors for PPCs are attributable to the patient's health conditions, whereas the other 50% are related to the surgical procedure and the anesthetic management itself (Canet et al., 2010).

Postoperative pulmonary complications are usually presented as a composite, which then includes possible fatal and nonfatal respiratory events of new onset occurring in the postoperative period. Currently, there is no agreement about which of these events should be considered as PPC, for example, respiratory failure, lung injury, pneumonia, prolonged or unplanned mechanical ventilation or intubation, hypoxemia,

atelectasis, broncho spasm, pleural effusion, pneumothorax, ventilatory depression, and aspiration pneumonitis (Jammer et al., 2015).

Despite advances in perioperative care in the last few decades, postoperative pulmonary complications are probably the leading cause of morbidity and mortality in adults undergoing chest and abdominal surgery. Post-operative pulmonary complications and cardiac complications are commonly regarded as the two major causes of perioperative problems in selected groups of patients undergoing these high-risk surgical procedures. Various changes in the respiratory system occur during the postoperative period that increase the risk of these complications, including consequences from the residual anaesthetic effect, the surgical procedure itself, and the effects of any pre-morbid conditions (Katsura, 2013).

Procedure-related risk factors include the type of surgery (abdominal, thoracic, neuro, head and neck, vascular, aortic aneurysm repair, and emergency surgery are all associated with higher risk of PPCs), the site of incision, prolonged operative time (exceeding three hours), and the type of anaesthesia (Smetana, 2009).

Patient-related risk factors include advanced age (equal to or greater than 60 years), pre-existing disease (for example chronic obstructive pulmonary disease, congestive heart failure), current smoking, alcohol consumption, functional dependence, impaired sensorium, recent marked weight loss, and American Society of Anesthesiologists (ASA) Physical Status (PS) Classification System class 2 (mild systemic disease without functional limitations) or severer status (Qaseem, 2006).

Postoperative respiratory complications represent the second most common perioperative complication after wound infection with an estimated incidence ranging from 2.0% to 5.6% for surgical procedures. Respiratory failure after general anesthesia and tracheal extubation has been shown to be one of the most meaningful factors associated with poor patient outcomes, leading to longer hospital stays, higher costs and increased 30 day mortality (Panchal et al., 2016).

Despite the prevalence and cost of pulmonary complications, there is a paucity of best-practice guidelines for postoperative pulmonary care in general. Ventilator-associated pneumonia (VAP) is an often-discussed entity, including recommendations for its prevention; however, strategies to avoid pulmonary complications among non-ventilated patients are less studied (Smetana, 2009).

Prevention of post-operative pulmonary complications begin with a thorough medical history. Special attention should be given to complaints related to underlying lung disease and smoking history. Exercise tolerance has been independently associated with improved survival after major abdominal operations (Dronkers et al., 2013).

Some estimates suggest that the incidence of post-operative pulmonary complication is anywhere between 5 and 40 % of patients following surgeries involving the abdomen (Seiler et al., 2009).

This prospective multicenter cohort study investigated pulmonary complications in an unselected cohort following major elective abdominal surgery. The data set was internally and independently validated. The incidence of PPC was 11.9 %. Post-operative pulmonary complications were associated with preoperative and intra operative risk factors. Despite the small cohort, the development of PPC had a significant impact on length of hospital stay and 30-day outcomes. The mortalities within our cohort were exclusively in patients with a post-operative pulmonary complication. Cause of death was not examined as part of the study, and thus, we were unable to infer causality; however, length of stay and outcomes data support the morbidity secondary to post-operative pulmonary complication (Bhangu et al., 2013).

Post operative pulmonary complications have a multi factorial aetiology including ventilation-perfusion mismatch and hypoxemia which is a consequence of general anaesthesia , postoperative pain, diaphragmatic dysfunction, decreased chest wall compliance and depressed airway reflexes (Canet et al ., 2010).

A patient safety summit statement recently recommended that PPC should be a measure of healthcare quality as it is likely to require a multifaceted and multidisciplinary approach to reduce the incidence (Shander et al., 2011).

Previous studies have suggested that between 17% and 88% of people having surgery on the upper abdomen will suffer complications that affect their lungs after the operation (postoperative pulmonary complications). The lung volume tends to fall after such surgeries. These complications can be made less likely and less severe with the careful use of treatments designed to encourage breathing in (inspiration) and thus increasing the volume of the lungs, as these volumes tend to fall after such surgeries. Incentive spirometers are mechanical devices developed to junior help people take long, deep, and slow breaths to increase lung inflation (Junior et al ., 2013).

The reasons for the occurrence of these complications are multifactorial. The surgery, anesthesia method that is applied and preoperative risk factors of the patients play an important role. Obesity, smoking, age, current chronic lung diseases and other co morbidities are patient risk factors. Apart from these, whereas anesthesia type, duration, use of different agents and efficacy of postoperative pain treatment are anesthesia-related risk factors, intervention time, surgical techniques and incision size represent surgical risk factors. Atelectasis, pneumonia, respiratory failure and trachea bronchial infection can be listed among the main post-operative pulmonary complications.

The most common postoperative complication is atelectasis. Pneumonia, on the other hand, is reported as the primary reason of mortality (Guimaraes et al., 2009).

1.2 Rationale

Prediction of outcomes after thoracic operations offers important benefits. Physicians anticipating those patients most prone to complications can provide special attention aimed at reducing morbidity and mortality. In the present climate, in which resources are becoming scarce and reimbursement follows strict guidelines, an institution equipped with reliable predictive data can begin to make the kinds of cost analysis predictions that will provide accurate financial projections. Investigators have attempted to predict outcome using spirometry , blood gas analysis, carbon monoxide diffusion capacity, and split lung function testing. Individual parameters have shown some promise at predicting pulmonary complications including death. Postoperative pulmonary complications (PPC) account for a substantial proportion of morbidity and mortality related to surgery and anesthesia and lead to longer hospital stays. The aim of this review is to describe the current evidence underpinning our understanding of PPC and to highlight measures that might become necessary at different points during the course of preoperative care. Through this study it will be possible to identify the post-operative respiratory complications as well as their associated risk indicators related to the thoracic surgery patients in NIDCH. Moreover, the study aimed at providing recommendations in light of the risk factors for the prevention of the respiratory complication. Besides, the study intends to put contribution to the establishment and enrichment of respiratory physiotherapy interventions in the patients at NIDCH in Mohakhali Dhaka. However, it is expected that physiotherapy professional development will be facilitated through the enrichment of knowledge, especially in an advanced area of respiratory physiotherapy. During the study data collection process investigator can help them to teach and give proper education and treatment about respiratory problems and preventive methods. It will help to focus and present the role and importance of physiotherapy service in for the ever increasing respiratory complication patients in Bangladesh.

1.3 Research Question:

What is the prevalence of post-operative pulmonary complication after thoracic surgery?

1.4 Objective of the study

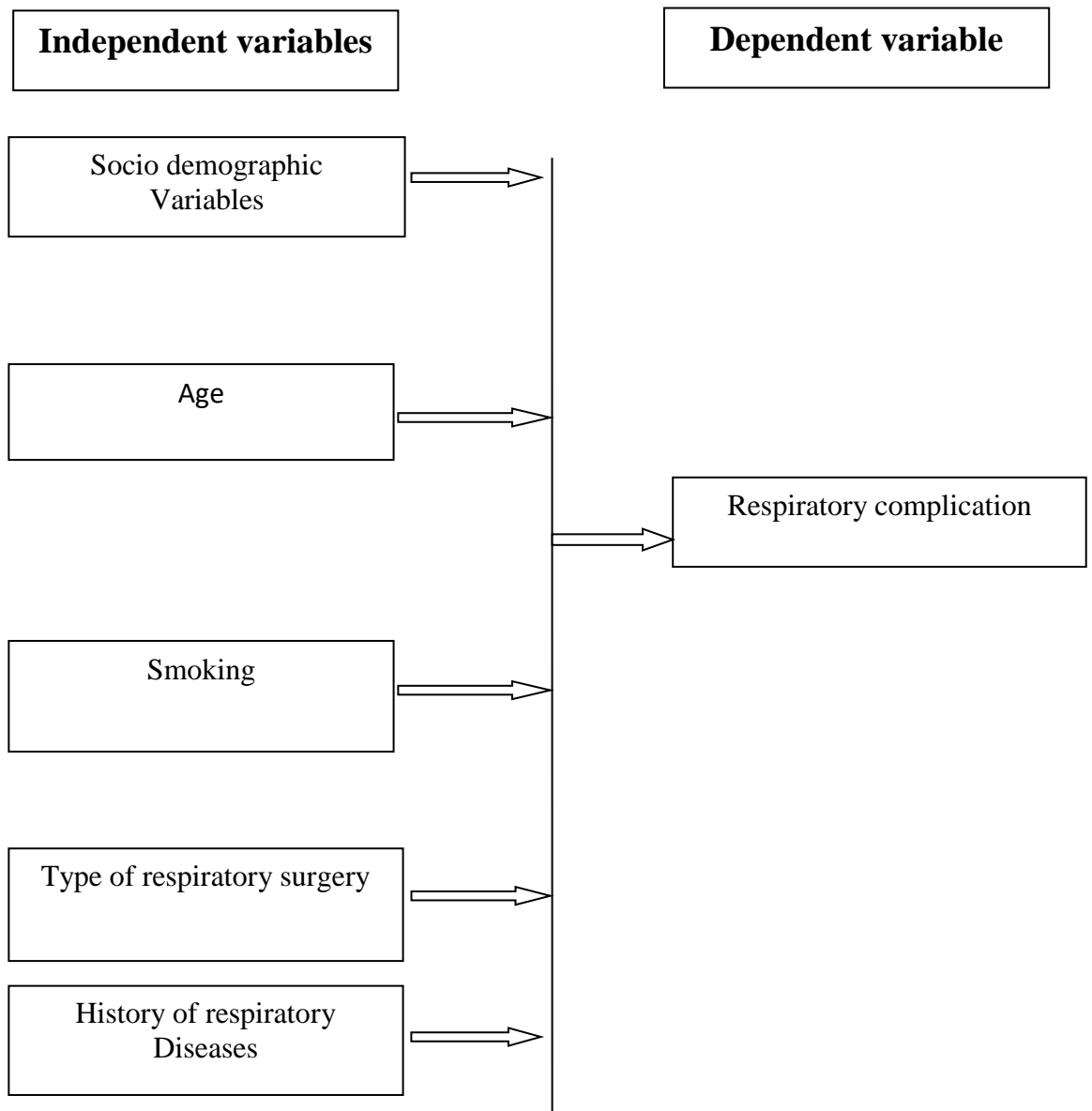
1.4.1 General objective

To identify the prevalence of post-operative pulmonary complication after thoracic surgery.

1.4.2 Specific objectives

1. To identify the prevalence of post-operative pulmonary complication of thoracic surgery patients.
2. To find out the common post-operative pulmonary complication among the thoracic surgery patients.
3. To spot the influencing demographic factors for such exposure cluster in regard to age, sex, previous occupations, long living space, smoking habit past history of physical exercise, history of respiratory disease, case history of respiratory diseases and past history of standard exposure to fume or dirt.
4. To determine the level of pulmonary complications among the thoracic surgery patients.

1.5 Conceptual framework



1.6 Operational Definition:

Haemoptysis: Haemoptysis is a symptom varying in its seriousness and in most cases hospitalization is required. A number of etiologies are described in the literature. Prevalence differs depending on when the study was performed and the country of the study (Lee et al., 2012).

Cough: Cough is a common symptom in patients with a range of respiratory and non-respiratory diseases, and it has been subdivided into acute and chronic cough dependent on duration (Chung et al., 2008).

Tuberculosis: Tuberculosis remains a major global public health threat and causes two million deaths per year worldwide. In order to fight TB the World Health Organization and other non-profit organization in need of rapid, sensitive, specific, inexpensive, and noninvasive diagnostic tool (Perkins et al., 2007).

Pneumonia: Pneumonia usually begins as a colonization of the mucosa of the nasopharynx followed by spread into the lower respiratory tract. The infection can be community acquired or nosocomial. Bacteria, viruses, atypical organisms, and fungi are all known to cause pneumonia (Zygun et al., 2012).

Breathlessness: Breathlessness is an important cause of exercise limitation and reduced quality of life for patients with chronic obstructive pulmonary disease (Rabe et al., 2006).

Atelectasis: Atelectasis is a common side effect of general anaesthesia. It is probable that a reduction in the area of atelectasis will lessen the risk of postoperative complications (Hedenstierna, 2012).

Cancer: According to WHO estimates for 2011, cancer now causes more deaths than all coronary heart disease or all stroke.

Chest tightness: In 2014, Irwin published a report in which they described 24 patients with asthma whose sole presenting clinical manifestation was chest tightness.

Postoperative pulmonary complications (PPCs) refer to the incidence of postoperative clinical manifestations of pulmonary abnormalities. These complications have a negative effect on disease progression, resulting in patients undergoing prolonged periods of hospitalization in addition to increasing the rate of postoperative mortality (Qaseem et al., 2006).

Haemoptysis is a symptom varying in its seriousness and in most cases hospitalization is required. A number of etiologies are described in the literature. Prevalence differs depending on when the study was performed and the country of the study (Lee et al., 2012)

To the best of our knowledge, epidemiological studies conducted in high-income countries are old single-centre studies involving ~100 patients. In a retrospective study in Israel, the main aetiologies were infectious respiratory disease (34%), followed by bronchiectasis (20%) and lung cancer (19%). In a study from South Korea, bronchiectasis was the main cause of haemoptysis (32.6% of cases) followed by tuberculosis (18.5%) and pulmonary fungal infections (10.8%). A French retrospective study that included >6000 patients found that bronchial carcinoma accounted for 14.9% of cases and was the leading cause of haemoptysis (Hirsh berg et al., 1997).

Cough is a common symptom in patients with a range of respiratory and non-respiratory diseases, and it has been subdivided into acute and chronic cough dependent on duration. An acute cough that lasts for less than 3 weeks is self-limiting and typically secondary to an upper respiratory- tract infection, whereas a cough that persists for more than 8 weeks is termed chronic, and often the symptom has persisted for much longer than 8 weeks by the time of presentation. Whereas acute, self-limiting cough remains a disorder for which supportive measures are adequate, chronic cough, which can persist for months and years, is a difficult clinical problem largely because of poor understanding of the pathophysiological processes involved and the absence of effective antitussive therapies. Results of some epidemiologic

studies^{1–4} suggest that chronic cough is very prevalent in the community (9–33%) and could be increasing in association with rising environmental pollution. Many patients seek medical advice because a chronic cough can seriously impair quality of life (Chung et al., 2008).

The World Health Organization (WHO) stated that 650 000 prevalent cases of multidrug-resistant tuberculosis (MDR-TB) occurred globally in 2010 (Raviglione et al., 2012).

Tuberculosis has long been recognized as an important occupational hazard for health care workers (HCWs). In the pre-antibiotic era, TB caused substantial morbidity and mortality among medical and nursing students. With the advent of effective antibiotic therapy and decreasing incidence in high-income countries (HICs), the risk declined, leading to complacency about nosocomial transmission. In the late 1980s, dramatic nosocomial outbreaks of multidrug-resistant (MDR) TB occurred—largely in human immunodeficiency virus (HIV) infected populations. These caused as many as 200 secondary active cases, of whom 50–80% died (Menzies et al., 1995).

Tuberculosis (TB) remains a major global public health threat and causes two million deaths per year worldwide. In order to fight TB the World Health Organization and other non-profit organization in need of rapid, sensitive, specific, inexpensive, and noninvasive diagnostic tool (Perkins et al., 2007).

Pneumonia usually begins as a colonization of the mucosa of the nasopharynx followed by spread into the lower respiratory tract. The infection can be community acquired or nosocomial. Bacteria, viruses, atypical organisms, and fungi are all known to cause pneumonia. In prospective research studies, a causative organism can be identified in nearly three quarters of cases of pneumonia. Respiratory viruses seem to be responsible for approximately 40% of cases of community-acquired pneumonia in children who are hospitalized, particularly in those under 2 years of age, whereas *Streptococcus pneumoniae* is responsible for 27% to 44% of the cases of community-acquired pneumonia (Michelow et al., 2004).

Pneumonia is the most common infectious complication associated with TBI, occurring in 20–60% of head-injured patients, rates that are generally believed to be increased compared to non-head-injured patients. Associated risk factors for the development of pneumonia after TBI include post injury immune suppression and prolonged mechanical ventilation (Zygun et al., 2012).

Breathlessness is an important cause of exercise limitation and reduced quality of life for patients with chronic obstructive pulmonary disease (Rabe et al., 2006).

Scott (2009) argues that in a normal adult, approximately 100 ml of trachea bronchial secretions are produced daily and cleared subconsciously. Millar (2003) demonstrate that sputum is the excess trachea bronchial secretions that is cleared from the airway by coughing or huffing. It may contain mucus, cellular debris, microorganism, blood and foreign particles. Questioning should be determined the colour , consistancy and quantity of sputum produced each day. This may clarify the severity and diagnosis the disease. In clinical practice sputum is often classified as mucoid, mucopurulent or purulent, together with an estimation of the volume.

Atelectasis is a common side effect of general anesthesia. It is probable that a reduction in the area of atelectasis will lessen the risk of postoperative complications. Recent recommendations aimed to reduce atelectasis and improve oxygenation address the importance of avoiding airway closure, especially during induction of and emergence from anaesthesia, two periods in which high oxygen concentrations are used (Hedenstierna , 2012)

According to WHO estimates for 2011, cancer now causes more deaths than all coronary heart disease or all stroke. Cancer is a leading cause of death in both more and less economically developed countries; the burden is expected to grow worldwide due to the growth and aging of the population, particularly in less developed countries, in which about 82% of the world's population resides. The adoption of lifestyle behaviors that are known to increase cancer risk, such as smoking, poor diet, physical inactivity, and reproductive changes (including lower parity and later age at first birth), have further increased the cancer burden in less economically developed

countries. In this article, we provide an overview of the global cancer burden, including the estimated number of new cancer cases and deaths in 2012 and the incidence and mortality rates by region for selected cancer sites.

A pus is mainly caused due to a bacterial infection of the skin due to boils, hair root infection or injury. Although rare, pus formation could also indicate a serious bacterial infection that might require surgery. If pus has formed on the skin surface, it is usually treated with the help of warm compresses and antibiotics. But most people end up bursting the pus-filled boil, which can further spread the infection to the surrounding areas and hamper the treatment (Jammer et al., 2015).

Surgical site infection is a common and serious complication following abdominal surgery. To prevent surgical site infection, it is essential to optimize perioperative conditions in the first hours following bacterial contamination (Coello et al., 2005).

The reasons for the occurrence of these complications are multi factorial. The surgery, anaesthesia method that is applied and preoperative risk factors of the patients play an important role. Obesity, smoking, age, current chronic lung diseases and other co morbidities are patient risk factors. Apart from these, whereas anaesthesia type, duration, use of different agents and efficacy of postoperative pain treatment are anaesthesia related risk factors, intervention time, surgical techniques and incision size represent surgical risk factors. Atelectasis, pneumonia, respiratory failure and trachea bronchial infection can be listed among the main PPCs. The most common postoperative complication is atelectasis. Pneumonia, on the other hand, is reported as the primary reason of mortality (Guimaraes et al., 2009).

Tobacco is the only legal drug that kills many of its users when used exactly as intended by manufacturers. WHO has estimated that tobacco use (smoking and smokeless) is currently responsible for the death of about six million people across the world each year with many of these deaths occurring prematurely. This total includes about 600,000 people are also estimated to die from the effects of second-hand smoke. Although often associated with ill-health, disability and death from non-

communicable chronic diseases, tobacco smoking is also associated with an increased risk of death from communicable diseases. WHO 2015 the occurrence of postoperative complications was significantly associated with smoking history, instances of previous pulmonary disease, ASA class >II and partial tumor resection. Smoking history and partial tumor resection were identified as independent risk factors of PPCs (Santos et al., 2016).

The influence of age on postoperative pulmonary complication rates is not well established. Most previous reviews have considered age to be a minor risk factor for the development of postoperative pulmonary complications. Studies that reported postoperative pulmonary complications by age categories varied with respect to the cutoff ages used to define age strata available Ten studies reported unadjusted postoperative pulmonary complication rates by age strata for patients older than 65 years of age (5 studies) and for patients older than 70 years of age (5 studies). Unadjusted postoperative pulmonary complication estimates for patients older than 65 years of age ranged from 1% to 34%, with a median post-operative pulmonary complication rate of 14%. For patients 70 years of age and older, the unadjusted postoperative pulmonary complication estimates ranged from 4% to 45%, with a median postoperative pulmonary complication rate of 15%. 16 (Wren et al., 2010).

The patient's overall health has a strong influence on the development of complications. Preexisting that affect normal respiratory and cardiovascular function and those associated with an abnormal immune response favor the development of complications (Canet & Mazo, 2010).

General anaesthesia can lead to reduced lung volumes and collapse of the alveoli as well as to reversible, patchy collapse of areas of lung (atelectasis) and subsequent low oxygenation. These problems are worse in those patients undergoing upper abdominal surgery, in those who have predisposing factors such as obesity and chronic lung disease and in smokers General anesthesia has biological effects on the respiratory system and also results in mechanical and functional changes that enhance those effects. These effects begin with anesthetic induction and can extend into the postoperative period. General anesthesia reduces functional residual capacity, with an

immediate and universal development of atelectasis in the dependent regions of the lung through three mechanisms: compression of lung tissue, absorption of alveolar air, and impairment of surfactant function. The resulting ventilation perfusion mismatch leads to increased shunt, dead space and hypoxemia. Anesthetics, analgesics and other preoperative drugs affect the central regulation of breathing, changing the neural drive of the upper airway and chest wall muscles and further contributing to PPC (McAlister et al., 2005).

Prolonged duration of surgery is a persistent risk factor encountered in most studies, and surgical procedures lasting more than 3 h are specifically associated with a higher risk of post-operative pulmonary complication (Nobili et al., 2012).

Obesity is a global health problem. It affected more than one-third of adults in the United States in 2011(Ogden et al., 2015) because the incidence of obesity has nearly doubled since 1980 (Stothard et al., 2009).

Allergic rhinitis is a disorder of the upper airways resulting from IgE-mediated inflammation of the nose upon contact of the nasal mucosa with allergens. Environmental exposure is an important but underappreciated risk factor that disturbs lipid metabolism in humans (Santos & Jialal, 2016).

Patients receiving selective nasogastric decompression had a significantly lower rate of pneumonia and atelectasis. There was no difference in aspiration rates. These results were confirmed in a more recent meta-analysis (Nelson & Edwards, 2005).

(Hallberg et al., 2008) acknowledged that exposure to tobacco smoke can either be direct as a result of cigarette smoking, or indirect as a result of exposure to environmental tobacco smoke. Whether direct or indirect, exposure to tobacco smoke contributes to asthma, chronic obstructive pulmonary disease (COPD) and lung cancer.

Many environmental factors contribute to the development of respiratory diseases. World Health Organization (2002) emphasized the importance of environmental

factors in lung disease and stated that respiratory diseases usually occur while the worker is exposed to common lung irritants such as air pollution or dust. In later stages of the disease, symptoms may occur away from work after exposure to common lung irritants. An estimated 15 percent to 23 percent of new adult asthma cases in the United States are due to occupational exposures. These exposures in the workplace also can worsen pre-existing asthma. Occupational asthma is usually reversible, but permanent lung damage can occur if exposure continues. It has been argued (Jaakkola & Pipari, 2003) that men working in forestry and with metals and women in the service industries (waitresses, cleaners and dental workers) have the highest risk for occupational asthma.

3.1 Study design

A cross sectional study was chosen to conduct the study. A cross sectional study was chosen as appropriate to achieve the aims. A cross-sectional study is a descriptive study in which disease and exposure status is measured simultaneously in a given population. Cross-sectional studies can be thought of as providing a "snapshot" of the frequency and characteristics of a disease in a population at a particular point in time (Environmental Health Investigations branch, 2009). Cross sectional study design was used for identifying the prevalence of post-operative respiratory complication following thoracic surgery patients.

3.2 Target population and sample population

Target population was people with post-operative pulmonary complication and sample population was in the National Institute of Chest Disease and Hospital (NIDCH)

3.3 Study setting

Thoracic surgery people in the National Institute of Disease of the Chest and Hospital (NIDCH) Mohakhali Dhaka was chosen for the study. All the patients who have respiratory complications after surgery in NIDCH were the population of this study because the researcher was interested to find out the proportion of post-operative respiratory complication among the thoracic surgery patients in NIDCH. Samples were selected by simple random sampling procedure.

3.4 Data collection method and tools

The face to face interview technique was used to collect data. For this the materials to successfully complete the interview session and collected the valuable data from the participants were used such as- question paper (Self-administered questionnaire Bengali version) , consent form, pen, file, clip board etc.

3.5 Sample size

The equation of sample size calculation are given below

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

Here,

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

$$P = 0.53 (\text{here, } p = \text{prevalence}) \text{ (Denu et al., 2015)}$$

$$q = 1 - p$$

$$= 1 - .53$$

$$= 0.47$$

$$d = 0.05$$

The actual sample size for this study is calculated as 383.

But as the study was done as a part of fourth professional academic research project and there were some limitations so the researcher had to limit with 50 as sample.

3.6 Sampling procedure of the study

Samples were selected by simple random sampling procedure considering the inclusion and exclusion criteria.

3.7 Inclusion criteria of the study:

- Both male and female were selected- In this study, the investigator wanted to explore the proportion of post-operative respiratory complication and its risk indicators.
- People who have respiratory surgery-Because the study focused on post-operative respiratory complication and its risk indicators among the thoracic surgery patients at NIDCH.
- Subject who were willing to participate in the study- Otherwise they will not give exact information that will helpful to the study.

3.7.1 Exclusion criteria of the study:

- Person who were mentally retardate. Because mentally retarded person could answer appropriately that can mislead the result of the study.
- Subject who are medically stable. Because medically unstable patient can be confused with the question that can mislead the result of the study

3.8 Ethical Consideration

The research proposal was submitted to Institute Review Board (IRB) of BHPI for oral presentation and defense was done in front of the IRB. Then IRB was approved the proposal. For data collection purposes, it was also taken permission from the director of National Institute of Disease Of the Chest and Hospital (NIDCH). Beginning the data collection, permission was obtained from the concerned authorities ensuring the safety of the participants. All information was kept in secure. World Health Organization (WHO) and Bangladesh Medical and Research Council (BMRC) rules were followed to conduct the study.

3.8.1 Data analysis

The data was collected and for the analysis of data descriptive statistics was used .Use the graph technique for analyzing data, calculated as percentages, and presented this using bar, column and pie charts by SPSS software version 20.0

SPSS is a comprehensive and flexible statistical analysis and data management solution. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts , and plots distributions and trends, descriptive statistics and conduct complex statistical analyses

In this study cross sectional study design was used to find out the level of physical activity among the school children at some selected schools in urban and rural area using self-administrated questionnaire .Total number of participants are 50.

Socio-demographic information

Age

In this study, the age range was 18-70, the mean age of the participants was 47.94 and median was 50.Standard deviation 13.85.

Table- 1: Age of the participant

Title	Number
Mean	47.94
Median	50.00
Standard deviation	13.850

Sex: In total 50 participants were selected. Among them male were 68% (n=34), female were 32% (n=16).

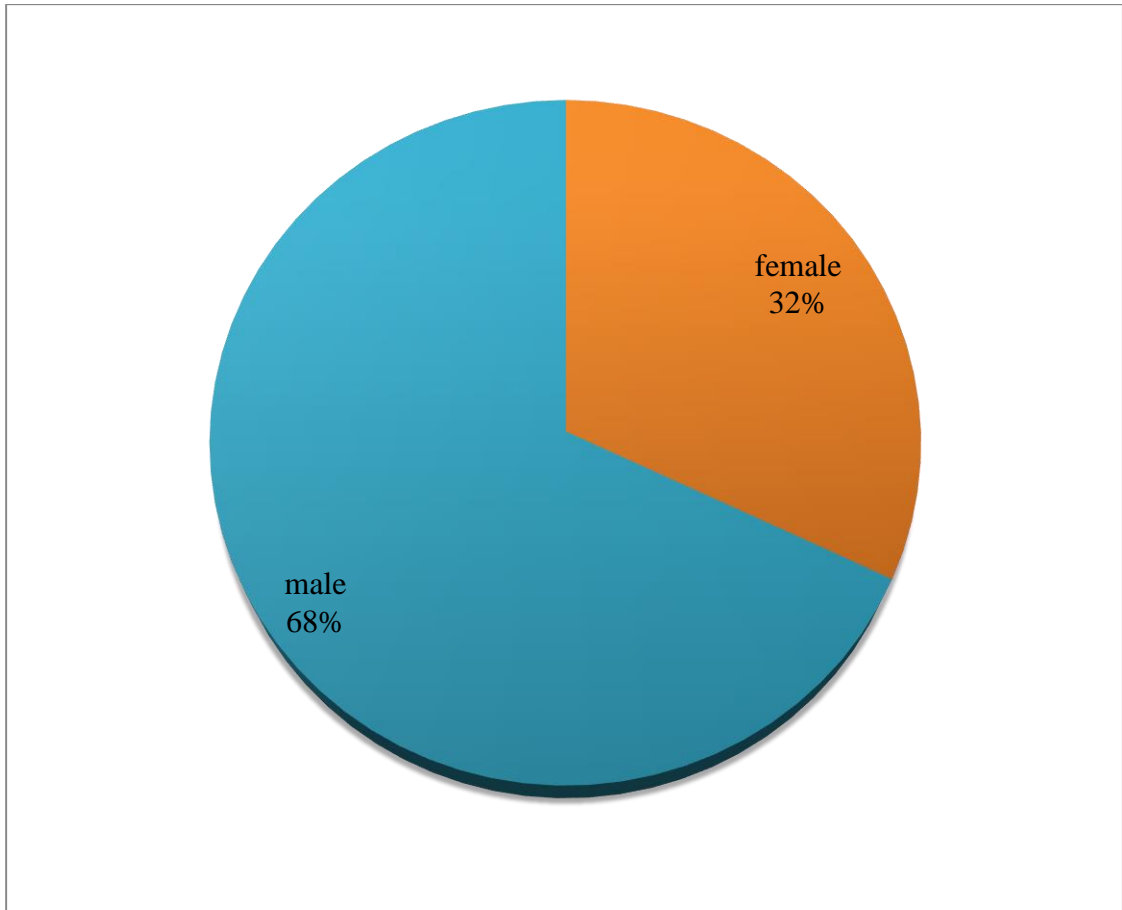


Figure -1: Sex of the participant

Marital status:

In total 50 participants were selected. Among them married were 94% (n=47), unmarried were 6% (n=3).

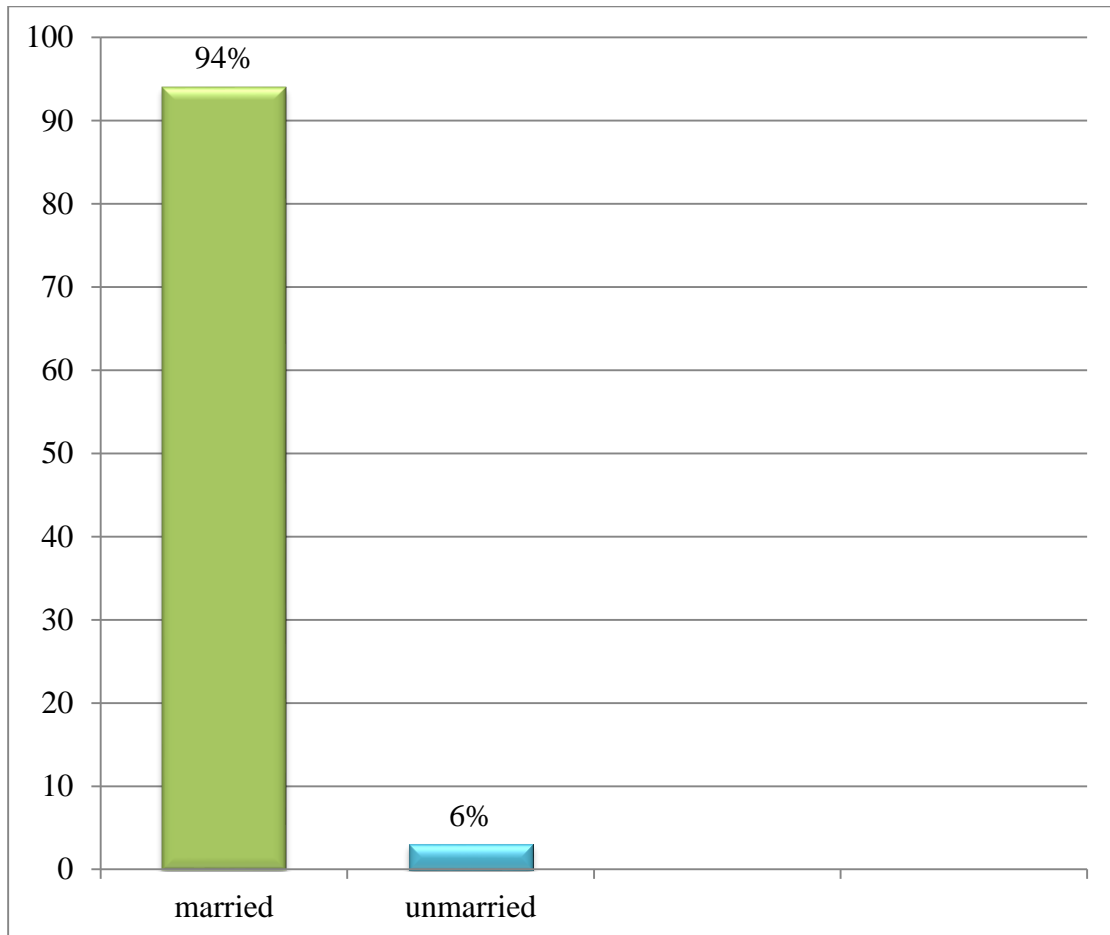


Figure-2: Marital status of the participant

Educational qualification:

In total 50 participants were selected. Among them less than primary were 26% (n=13), primary completed were 34% (n=17), SSC completed were 22% (n=11), HSC completed were 18% (n=9)

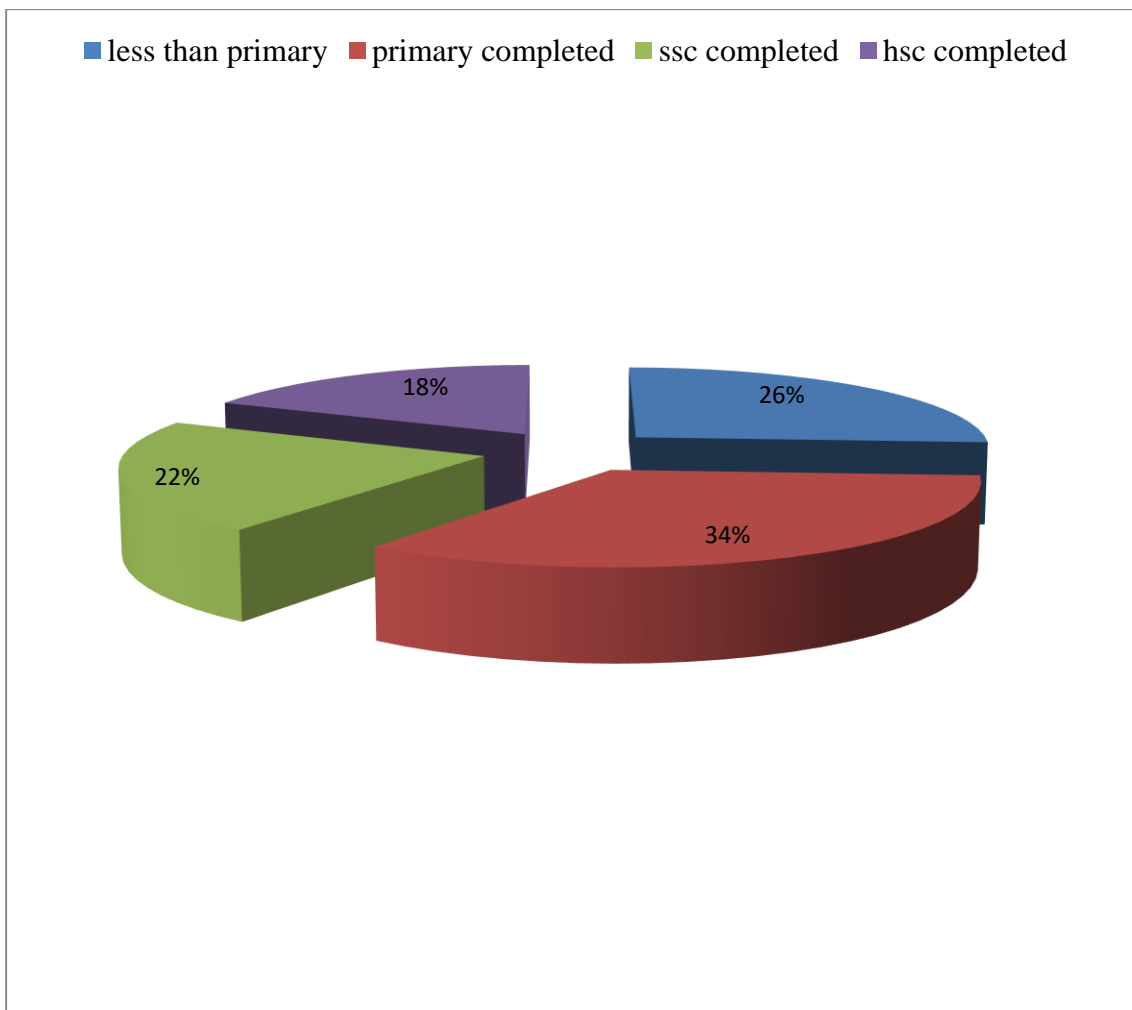


Figure-3: Educational qualification of the participant

Religion:

In total 50 participants were selected. Among them Muslim were 68% (n=34), Hindu were 20% (n=10), others were 12% (n=6).

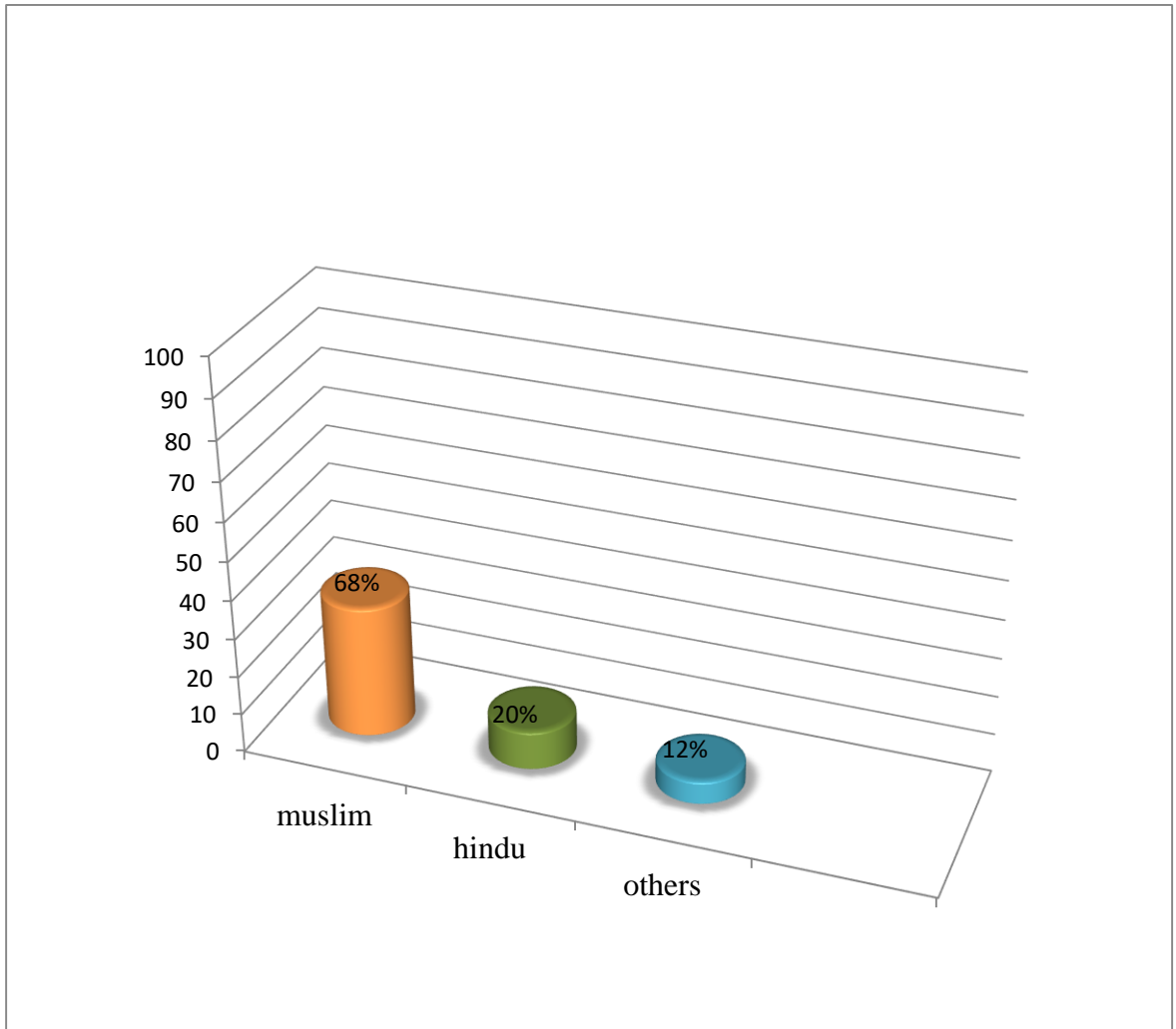


Figure -4: Religion of the participant

Previous occupation:

In total 50 participants were selected. Among them housewife were 30% (n=15), survive holder were 36% (n=18), business were 28% (n=14), others were 6% (n=3).

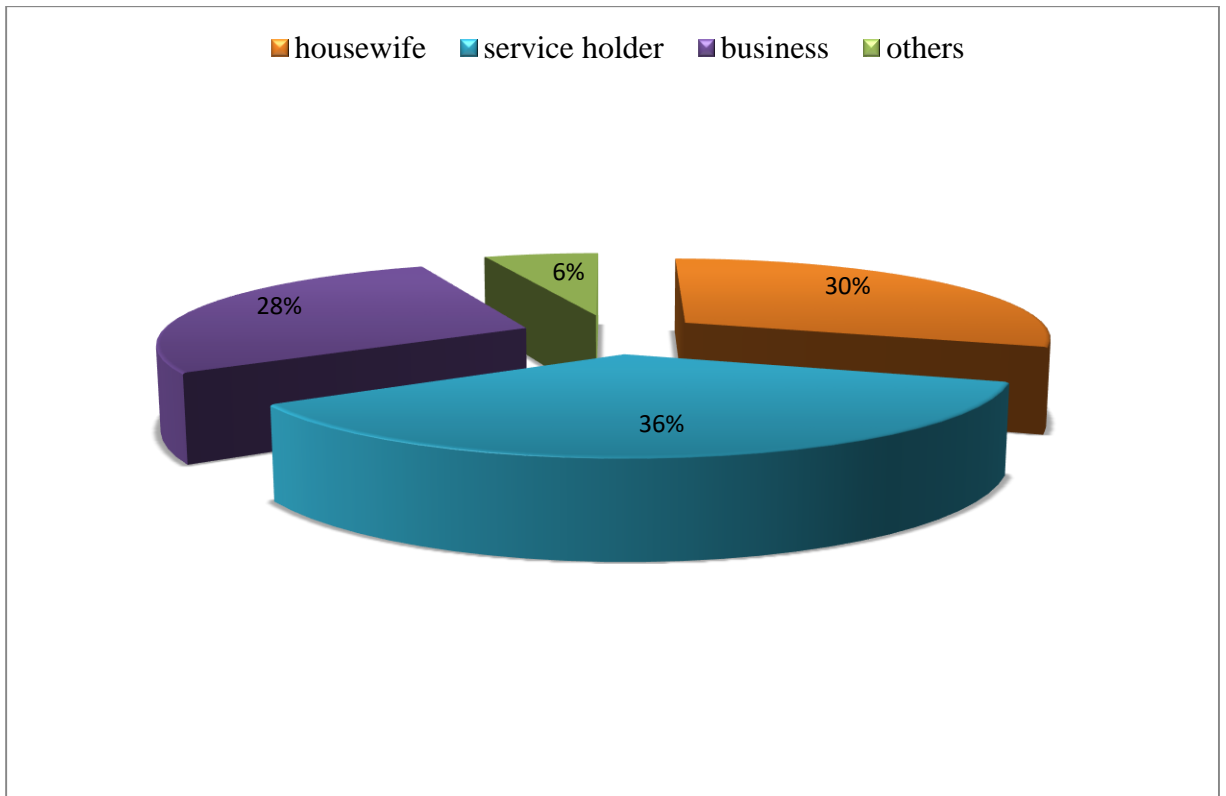


Figure 5: Previous occupation of the participant

Family income:

In total 50 participants were selected. Among them <5000 were 46% (n=23), 10000-15000 were 52% (n=26), >25000 were 2% (n=1).

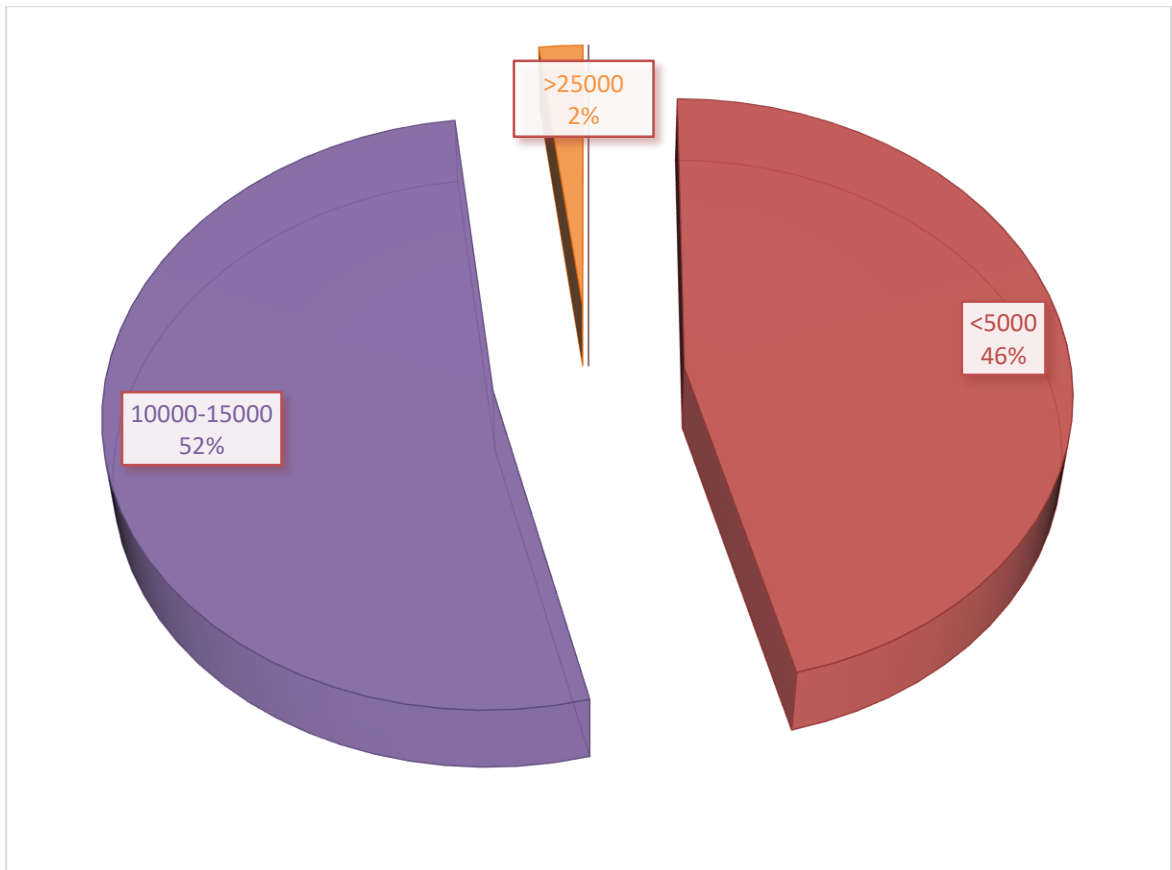


Figure 6: Family income of the participant

Living area:

In total 50 participants were selected. Among them urban area were 54% (n=27), rural area were 46% (n=23).

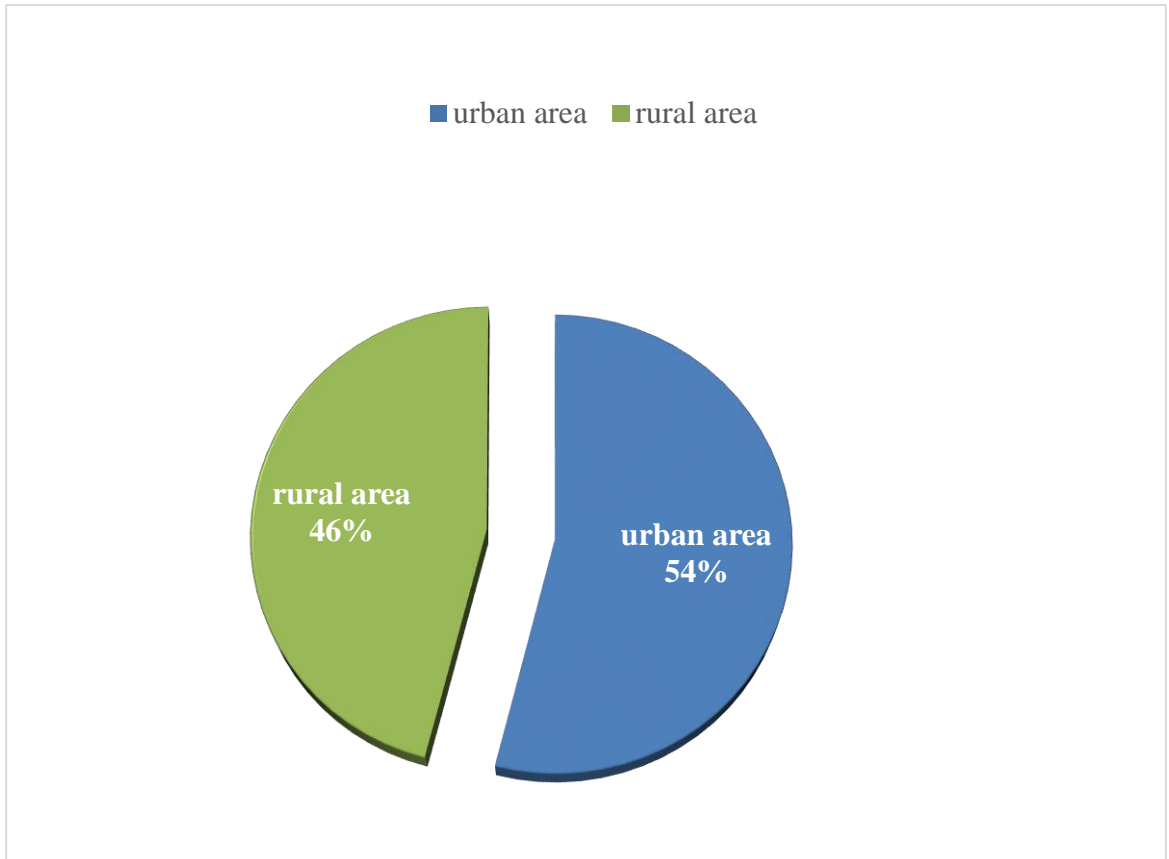


Figure 7: Living area of the participant

Respiratory complications: In total 50 participants were selected, 70% (n=35) were suffering from respiratory complications. Among them 30% (n=15) were not suffering from respiratory complication.

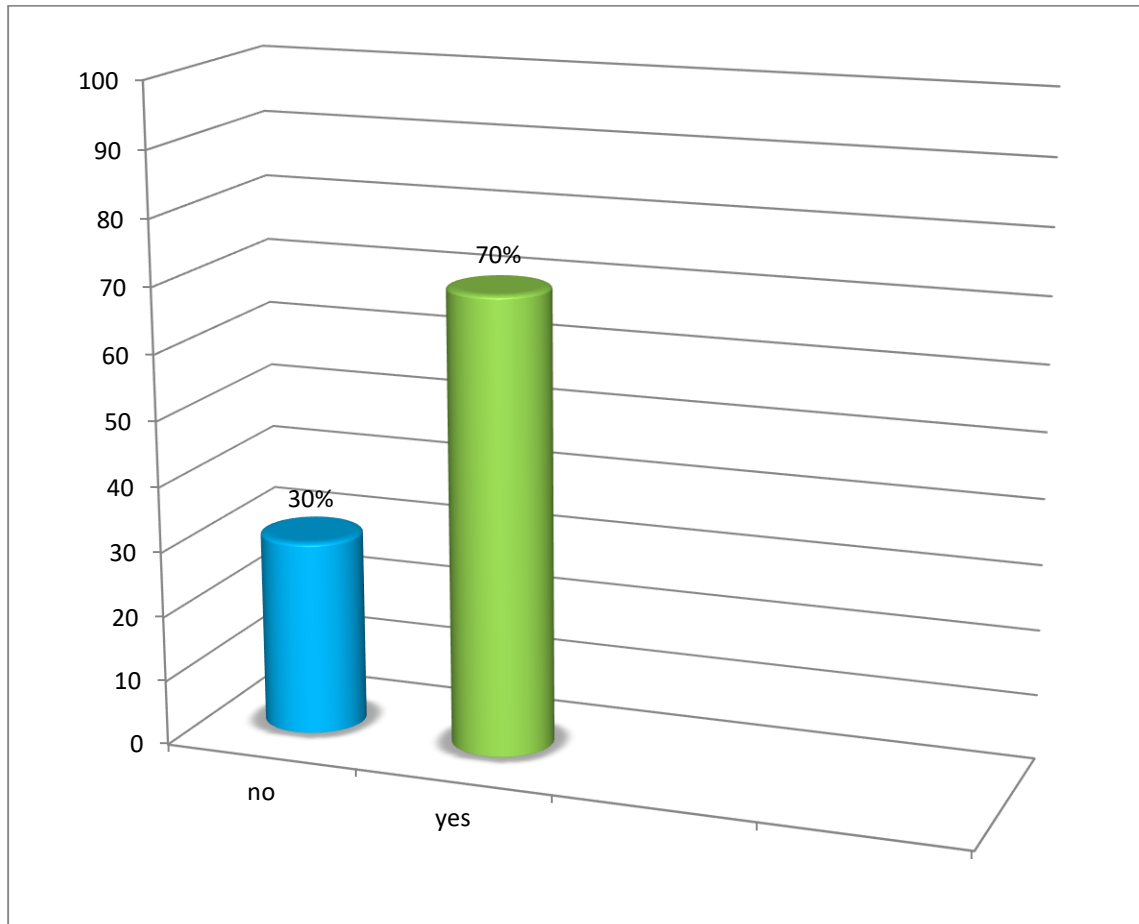


Figure 8: Respiratory complication of the participant

Cough:

In total 50 participants were selected. Among them 54% (n=27) were suffering from cough , 46%(n=23) were not suffering from cough.

Table 1: Cough that present among the participant

	Frequency	Percent
No	23	46.0
Yes	27	54.0
Total	50	100.0

Chest tightness:

In total 50 participants were selected. Among them 44% (n=22) were suffering from chest tightness and 56% (n=28) were not suffering from chest tightness.

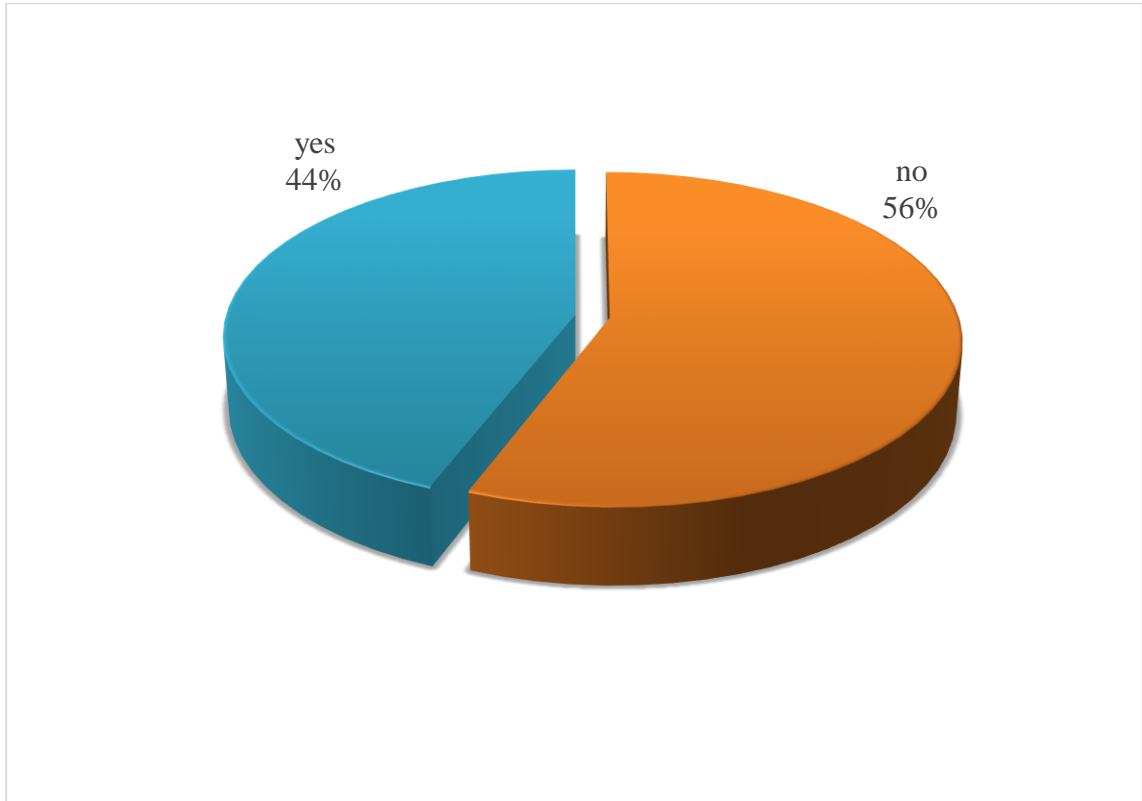


Figure 9: Chest tightness of the participant

Pneumonia:

In total 50 participants were selected. Among them 52% (n=26) were suffering from pneumonia 48% (n=24) were not suffering from pneumonia,

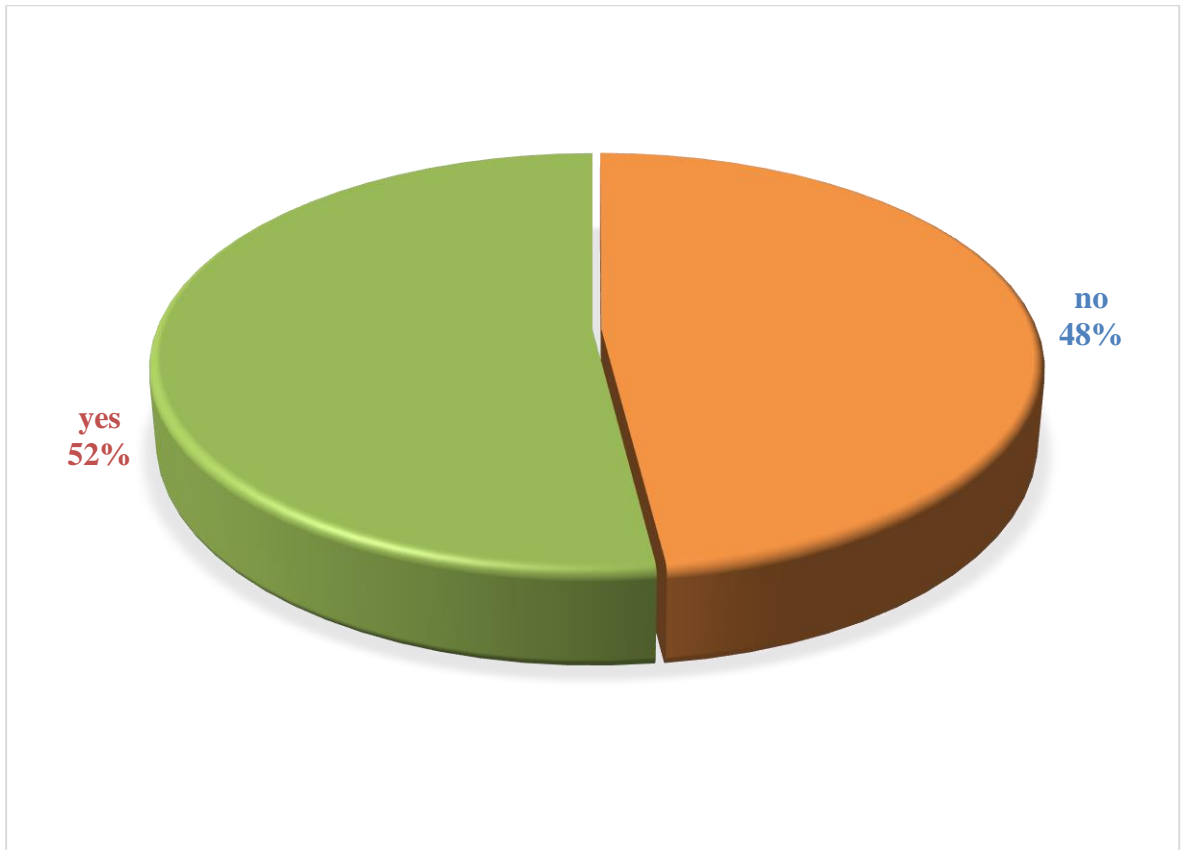


Figure 10: Pneumonia of the participant

Haemoptysis:

In total 50 participants were selected. Among them 40% (n=20) were suffering from haemoptysis and 60%(n=30) were not suffering from haemoptysis,.

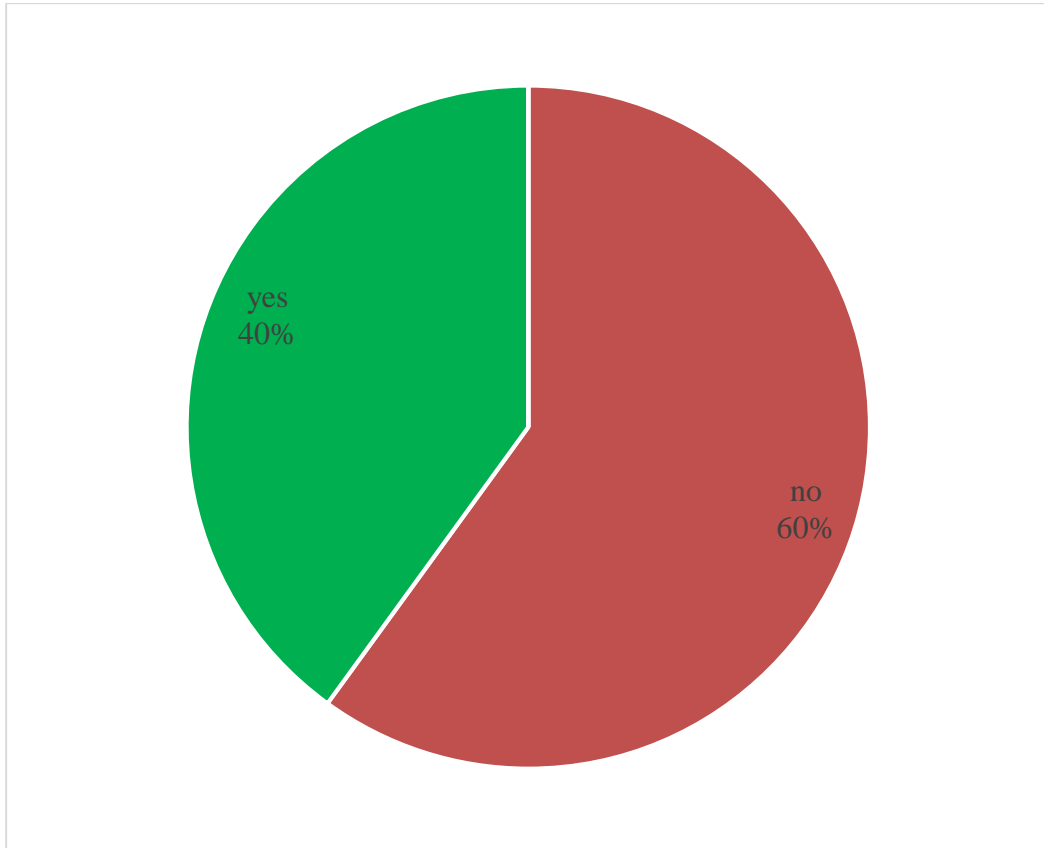


Figure 11: Haemoptysis of the participant

Atelectasis:

Among 50 participants, 56% (n=28) were suffering from atelectasis and 44% (n=22) were not suffering from atelectasis.

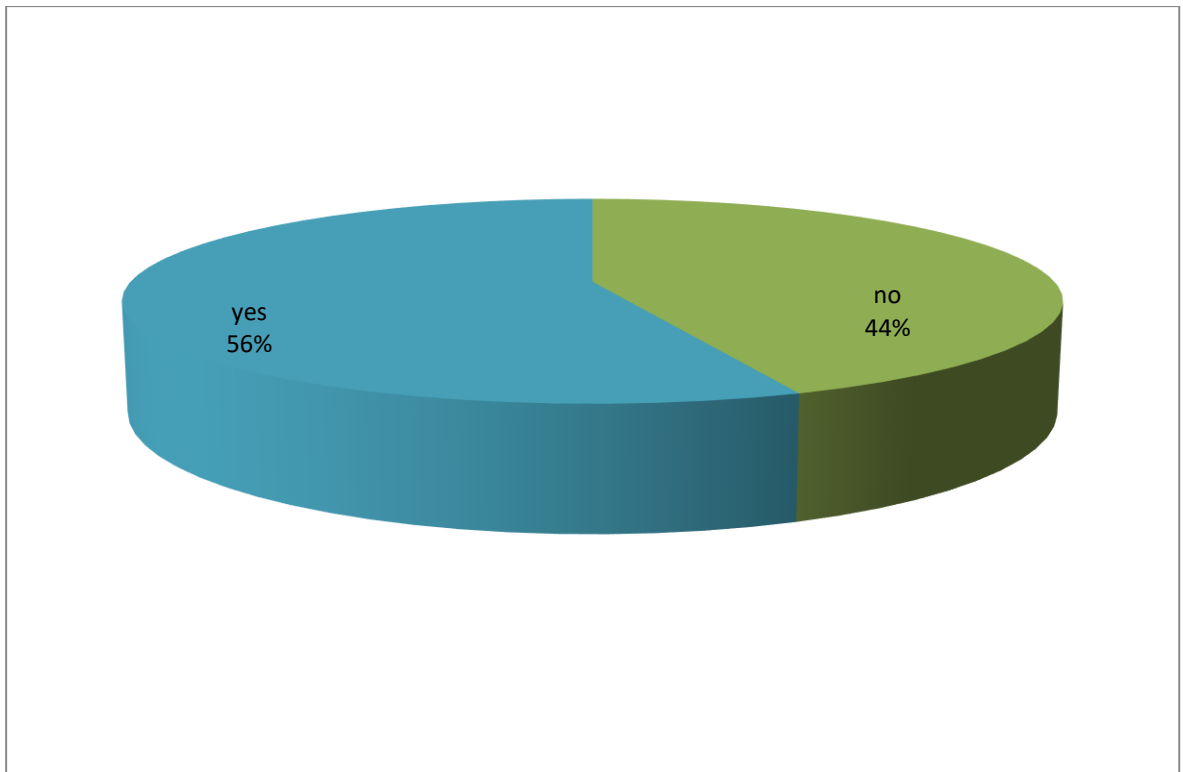


Figure 12: Atelectasis of the participant

Cancer:

In total 50 participants were selected. Among them 12% (n=6) were suffering from cancer and 88% (n=44) were not suffering from cancer.

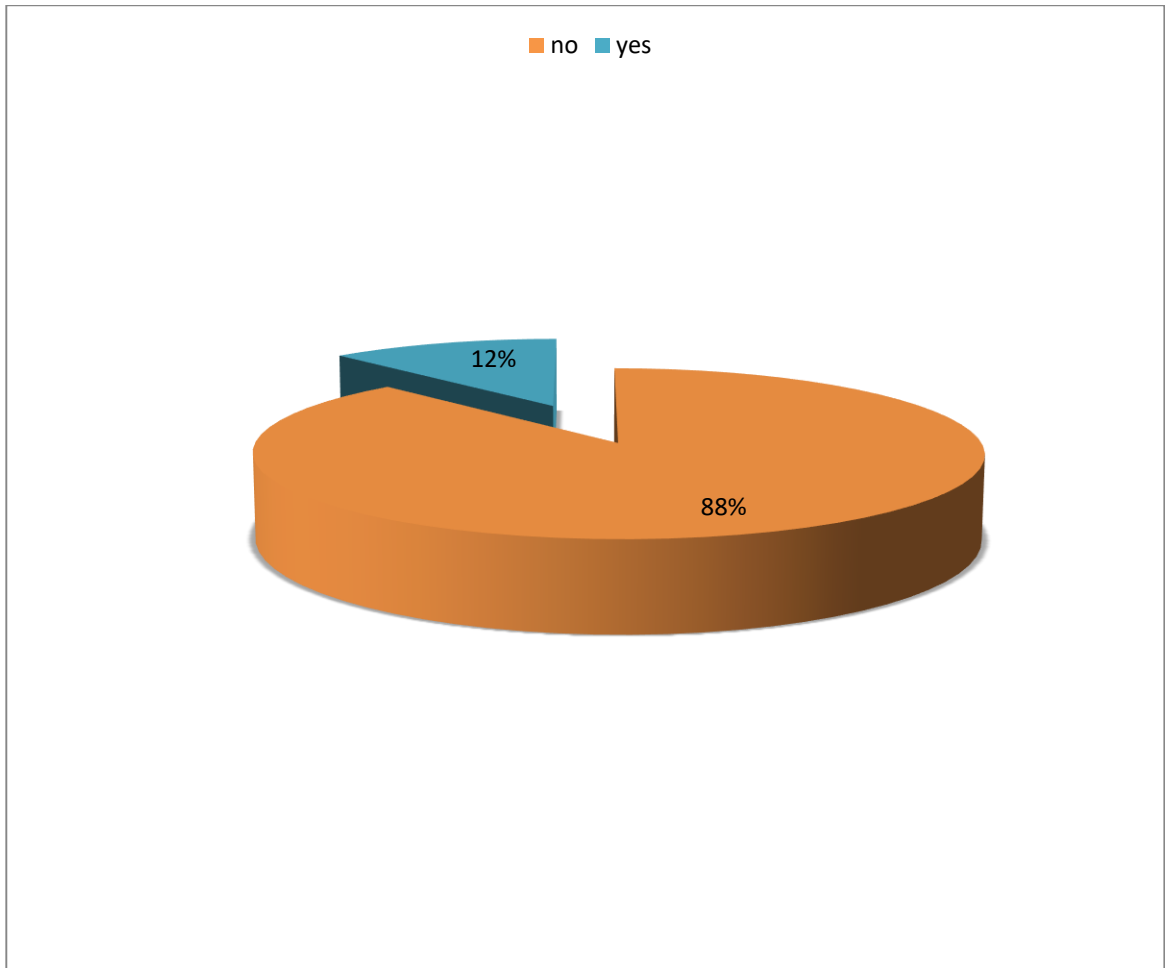


Figure 13: Cancer of the participant

Pus formation:

In total 50 participants were selected. Among them , 28%(n=14) were suffering from pus formation and 72%(n=36) were not suffering from pus formation.

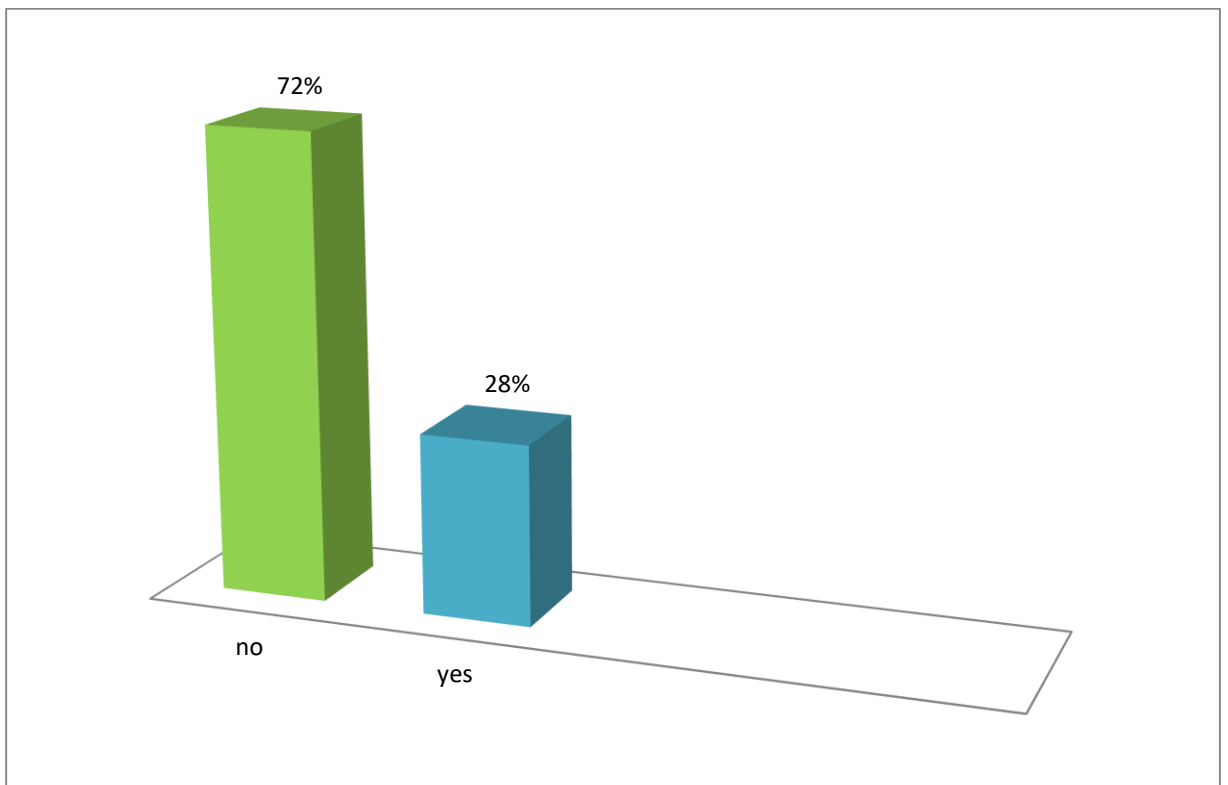


Figure 14: Pus formation of the participant

Throat tightness:

In total 50 participants were selected. Among them 52% (n=26) were suffering from throat tightness and 48% (n=24) were not suffering from throat tightness.

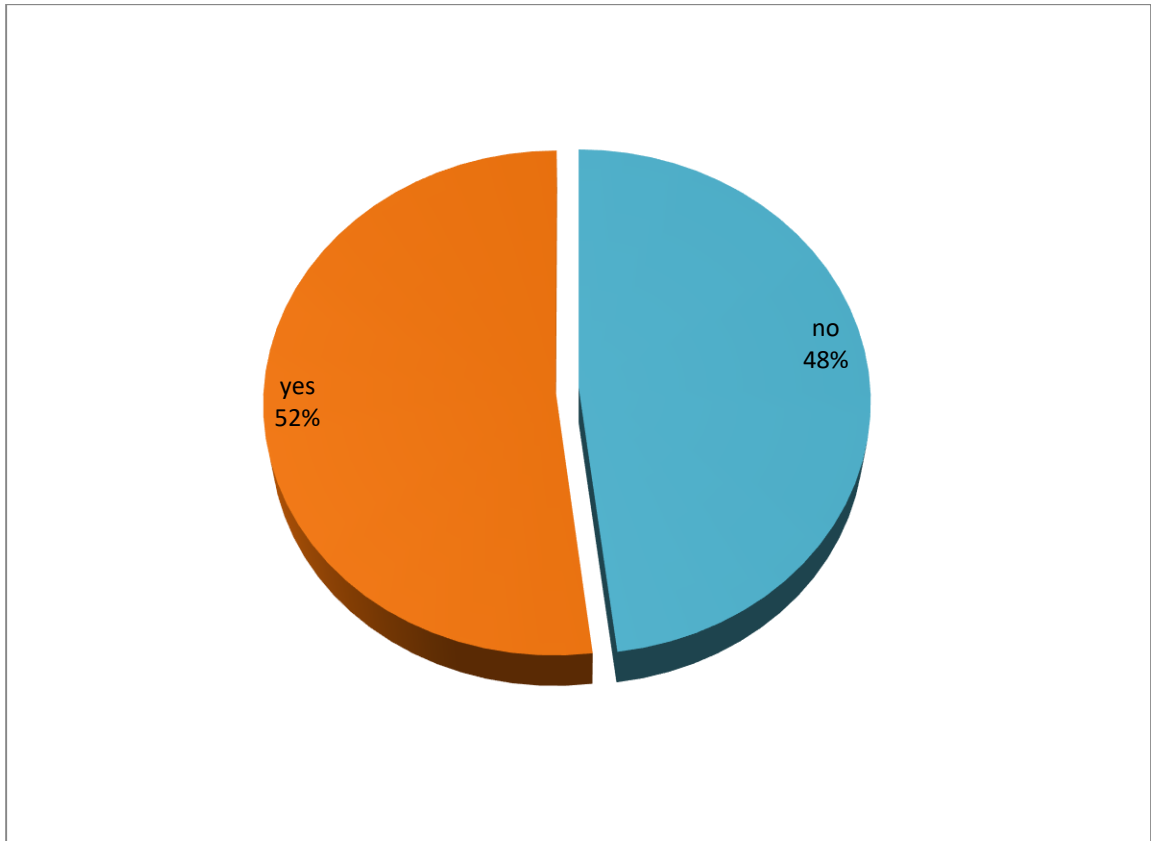


Figure 15: Throat tightness of the participant

Breathlessness:

In total 50 participants were selected. Among them 58% (n=29) were suffering from breathlessness and 42% (n=21) were not suffering from breathlessness,

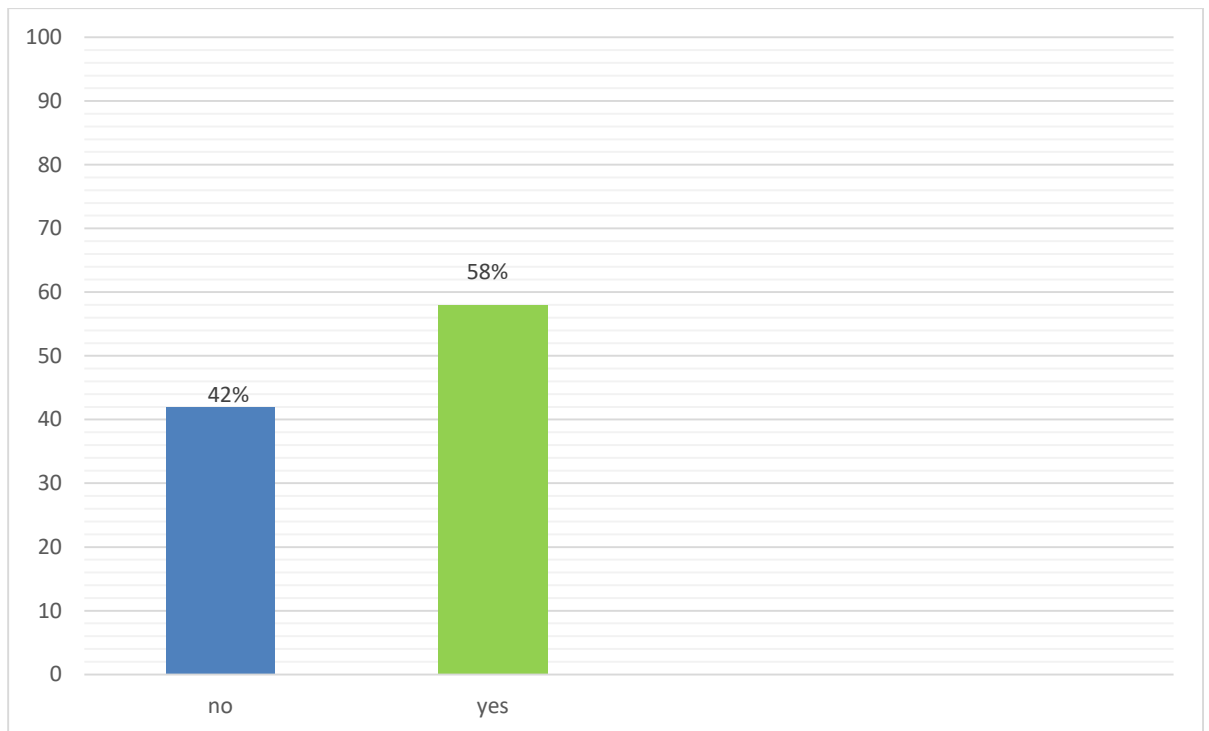


Figure 16: Breathlessness of the participant

Tuberculosis:

In total 50 participants were selected. Among them 6% (n=3) were suffering from tuberculosis and 94% (n=47) were not suffering from tuberculosis.

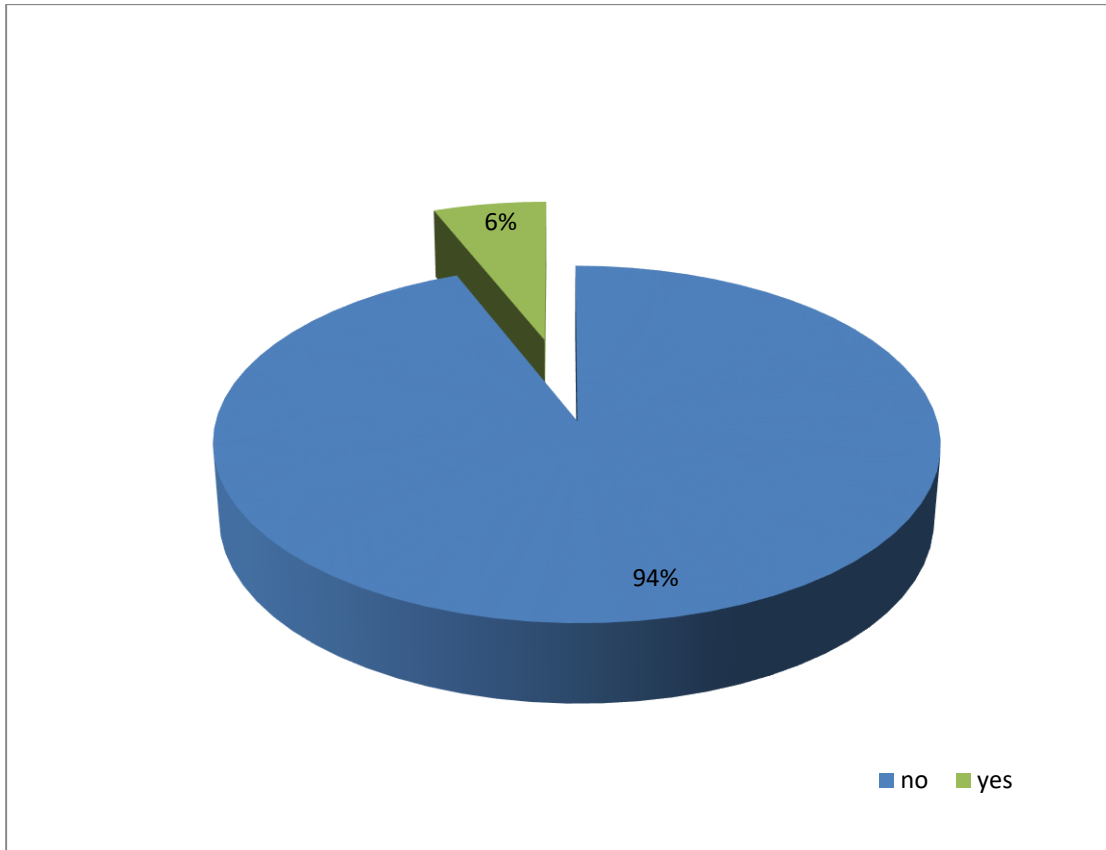


Figure 17: Tuberculosis of the participant

Smoked cigarettes:

In total 50 participants were selected. Among them cigarettes smoker were 48% (n=24), cigarettes non-smoker were 52% (n=26).

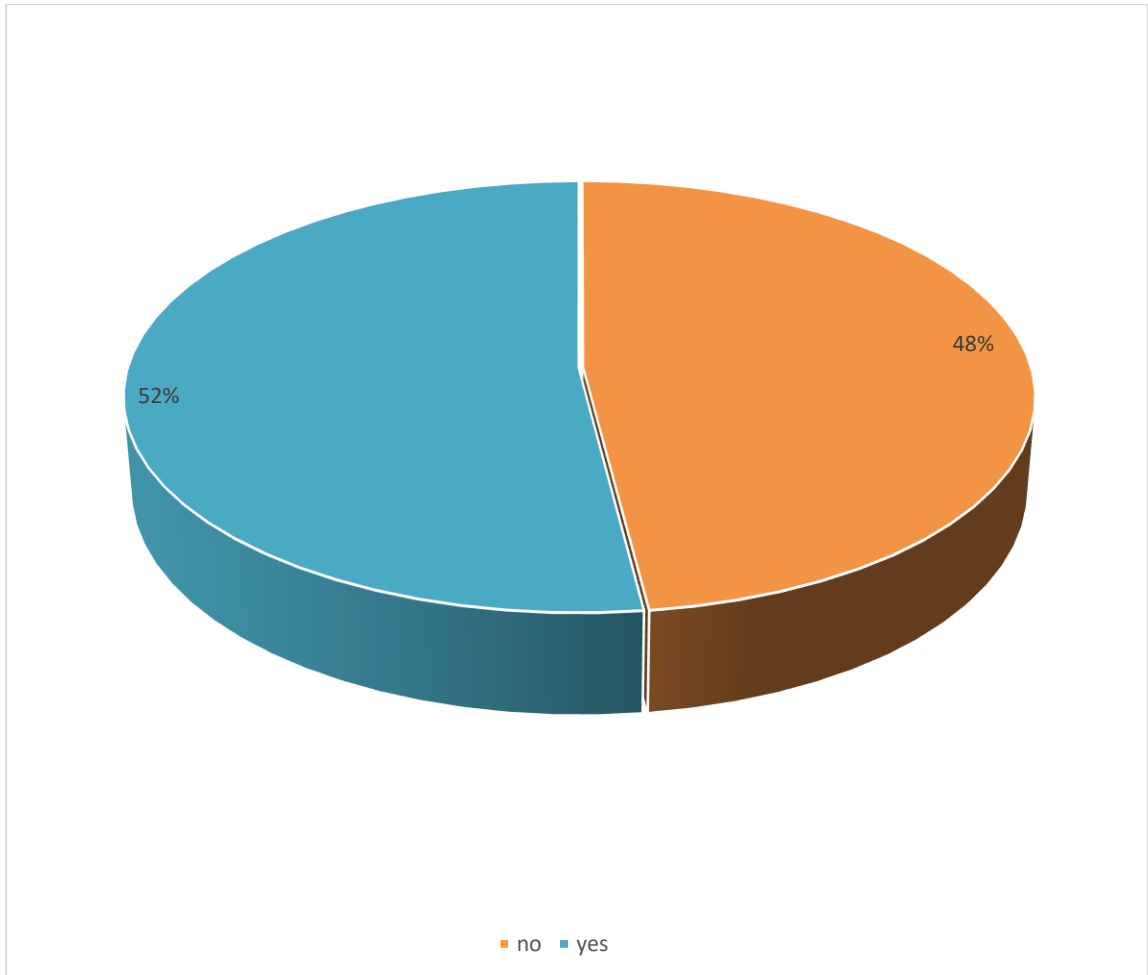


Figure 18: Smoked cigarettes of the participant

Exposed regularly to chemical nature:

In total 50 participants were selected. Among them 74% (n=37) were exposed regularly to chemical nature 26% (n=13) were not exposed regularly to chemical nature.

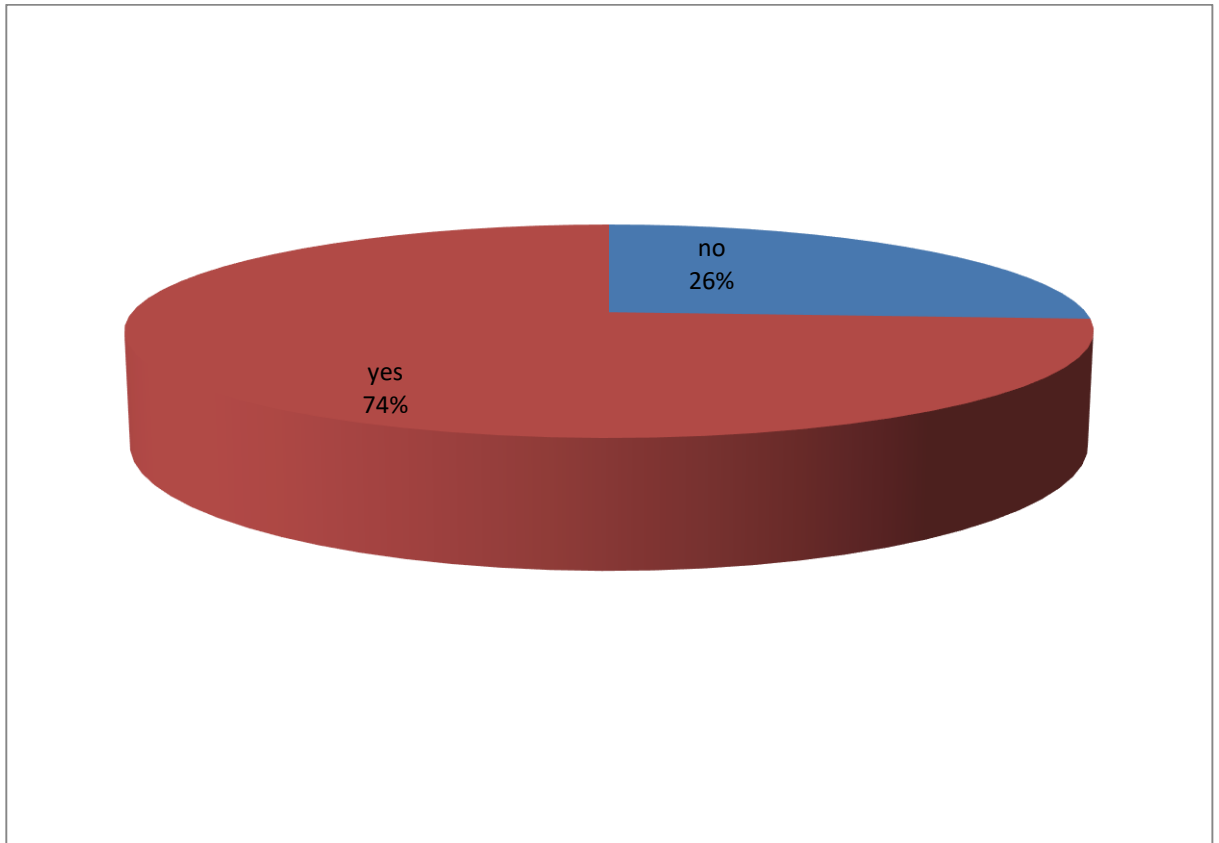


Figure 19: Exposed regularly to the chemical nature

Physical exercise:

In total 50 participants were selected. Among them, 8% (n=4) performed physical exercise and 92% (n=46) did not performed physical exercise.

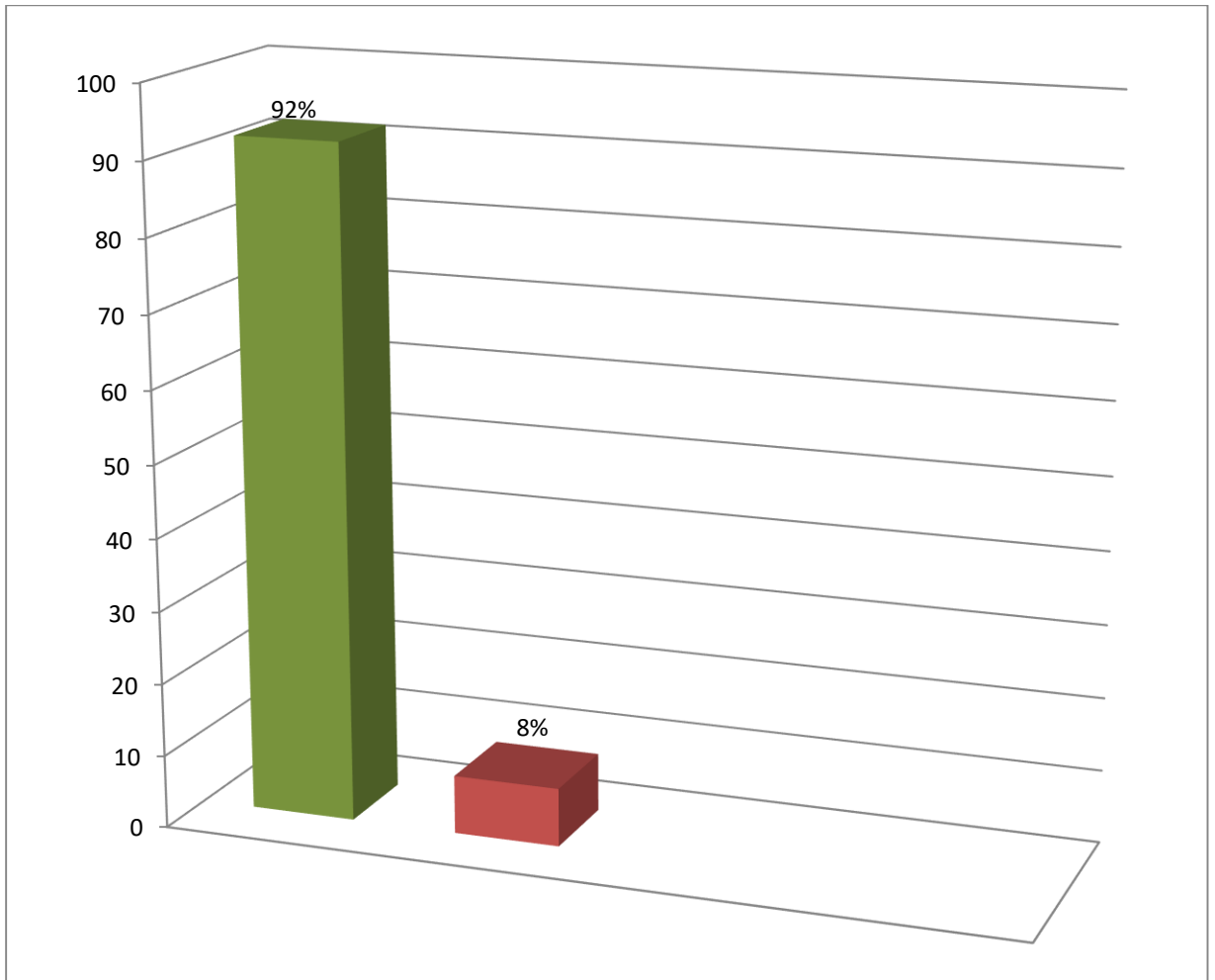


Figure 20: Performed Physical exercise of the participant

Family member respiratory disease:

In total 50 participants were selected. Among them, 38% (n=19) family members were suffering from respiratory disease and 62% (n=31) family were not suffering from respiratory disease,.

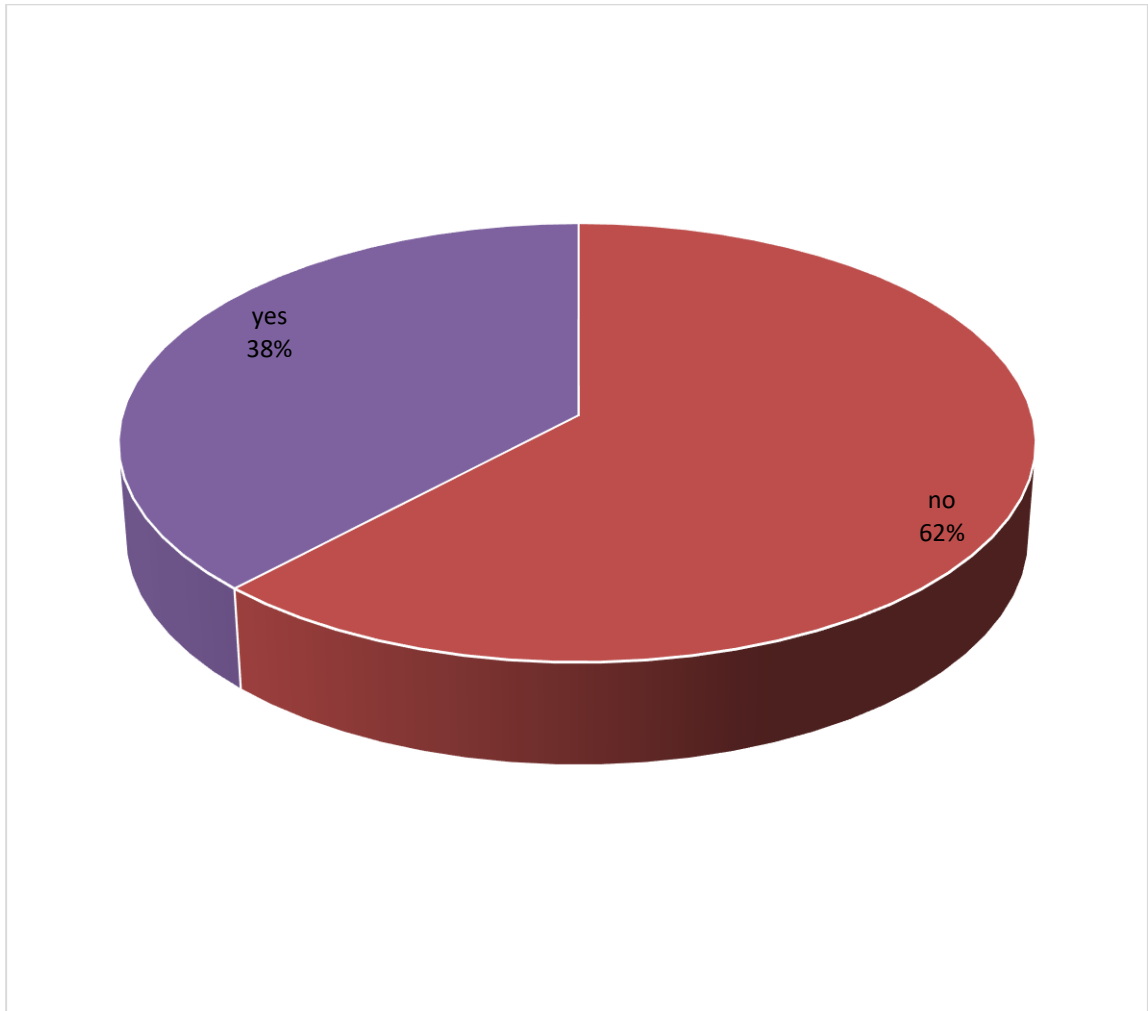


Figure 21: Family member respiratory disease

Physical therapy:

In total 50 participants were selected. Among them 20% (n=10) received physical exercise and 80% (n=40) did not receive physical therapy.

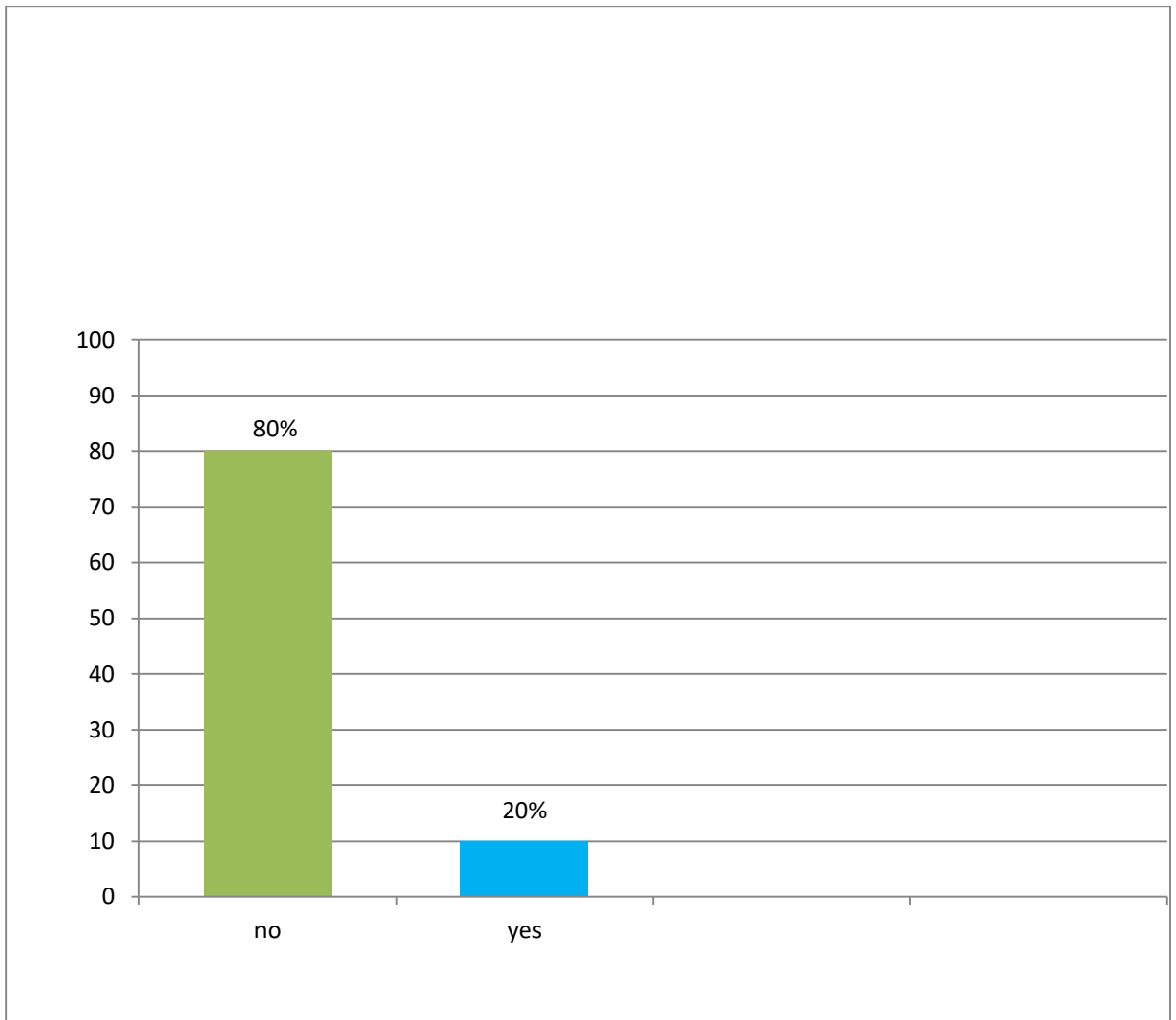


Figure 22: Receive physical therapy of the participant

The study was conducted with 50 participants. Among them 18-30 years were 8% (n=4), 31-42 years were 26% (n=13), 43-60 years were 48% (n=24), 60-70 years were 18% (n=9). Most of them were 43-60 years 48% (n=24) and 31-42 years 26% (n=13%).

In total 50 participants were selected. Among them male were 68% (n=34), female were 32% (n=16). Denu et al., 2015 analyzed from 405 patients during the study period. The mean age was 33.2 years with standard deviation of 16.8 years. Of all, 208 (51.4%), were female and the rest were male).

Educational qualification: In total 50 participants were selected. Among them less than primary were 26% (n=13), primary completed were 34% (n=17), SSC completed were 22% (n=11), HSC completed 18% (n=9).

Family member respiratory disease: In total 50 participants were selected. Among them 38% (n=19) family were suffer from respiratory disease and 62% (n=31) family were not suffer from respiratory disease, Agostini et al., 2009 found that two hundred and thirty-four patients underwent pulmonary resections during the study period, 137 of whom were male.

Respiratory complication: In total 50 participants were selected. Among them 70% (n=35) were suffering from respiratory complications and 30% (n=15) were not suffering from respiratory complications, Foroulis et al., 2014 found that Overall, 33 out of the 719 patients (4.6%) underwent early re-operation for managing surgical postoperative complications during the 4-year study period. The overall incidence of complications observed in the 719 patients was 22.2%.

Cough: In total 50 participants were selected. Among them 54% (n=27) were suffering from cough and 46% (n=23) were not suffering from cough. Pneumonia: In total 50 participants were selected. Among them 52% (n=26) were suffering from pneumonia and 48% (n=24) were not suffering from pneumonia, Patients who developed postoperative pulmonary complications were 88 (21.7%).

Of which 60.2% were emergency patients. Among the postoperative pulmonary complications evaluated, majority were postoperative pneumonia 75 (85.2%) (Denu et al., 2015)

Atelectasis: In total 50 participants were selected. Among them 56 % (n=28) were suffering from atelectasis and 44 % (n=22) were not suffering from atelectasis,.

725 post-operative pulmonary complication were recorded in 404 patients (7.9% of the 5,099 patients studied). Respiratory failure was the most frequent complication (241 patients, 4.7%), atelectasis (122, 2.4%) (Mazo et al., 2014).

Exposed regularly to chemical nature: In total 50 participants were selected. Among them 74 % (n=37) were exposed regularly to chemical nature and 26 % (n=13) were not exposed regularly to chemical nature, Smoked cigarettes: In total 50 participants were selected. Among them cigarettes smoker were 48% (n=24), cigarettes nonsmoker were 52% (n=26) in this study only 0.7% were smoker among 405 patients of participants were smokers (Denu et al., 2015).

Patients who developed postoperative pulmonary complications were 88 (21.7%). Of which 60.2% were emergency patients. Among the postoperative pulmonary complications evaluated, majority were postoperative pneumonia 75 (85.2%) followed by Bronchitis 10 (11.4%), respiratory failure 1 (1.1%) laryngeal edema 1 (1.1%) and haemothorax 1 (1.1%).

Chest tightness: In total 50 participants were selected. Among them 44 % (n=22) were suffering from chest tightness and 56 % (n=28) were not suffering from chest tightness, Exposed regularly to chemical nature: In total 50 participants were selected. Among them 74% (n=37) were exposed regularly to chemical nature and 26 % (n=13) were not exposed regularly to chemical nature.

Pus formation: In total 50 participants were selected. Among them 28 % (n=14) were suffering from pus formation and 72 % (n=36) were not suffering from pus formation, Hemoptysis: In total 50 participants were selected. Among them 40% (n=20) were suffering from haemoptysis and 60 % (n=30) were not suffering from hemoptysis,

Physical therapy: In total 50 participants were selected. Among them 20 % (n=10) received physical exercise and 80 % (n=40) did not received physical therapy.

This was done in a short period of time, researcher should take more time to conduct this study. This study cannot be generalized to the whole population as the sample size was very small and findings need to be confirmed with larger studies.

CHAPTER-VI CONCLUSIONS AND RECOMMENDATION

The clinical and potential economic impact of post-operative pulmonary complication is marked. Five significant independent preoperative risk factors have been identified, with smoking status modifiable while others factors such as COPD and BMI could be optimized .The impact of such targeted will require further evaluation. An ASA score \$3 indicated an increased risk of post-operative pulmonary complication in this study. Consistent with a growing body of evidence, preoperative spirometry did not help to identify patients at increased risk of post-operative pulmonary complication. Pulmonary complications are responsible for significant numbers of deaths and morbidity of patients undergoing thoracotomy the future development and adaption of innovative strategies is required to reduce their impact in an ageing co morbid population .This study makes it easier to know the prevalence of post-operative pulmonary complication after thoracic surgery at NIDCH

6.1 Recommendation

The investigator has tried to show prevalence of post-operative respiratory complications and its risk indicators among the patients of National Institute of Disease of the Chest and Hospital according to participants view. But due to limitation the investigator was not able to gather huge amount of participant and for this result cannot be generalized in all the hospitals over the Bangladesh. So for further study it is recommended to increase sample size to generalize the result in all of the post-operative patients in different hospital Bangladesh .The purpose of this study is to identify the prevalence of post-operative pulmonary complications among the patients of National Institute of Disease of the Chest and Hospital .researcher identified some further step that might be taken into consideration for the better accomplishment of further research. For the ensuring of the generalizability of the research it is recommended to investigate large sample. So for further study researcher strongly recommended to include different hospitals all over Bangladesh. Beside this in this study the ratio of male and female participants were unequal.

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APPENDIX

সম্মতিপত্র (বাংলা)

আসলামুআলাইকুম / নমস্কার, আমার নাম মোঃ গৌরব হাসান, আমি বাংলাদেশ হেল্থপ্রফেশনাল ইন্সটিটিউটে(বিএইচপিআই ঢাকাবিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অধীনে করছি যা আমার ফিজিওথেরাপী স্নাতক কোর্সের আংশিক অধিভুক্ত যার শিরনাম “বক্ষ সার্জারি পরবর্তী শ্বাসতন্ত্রের জটিলতারহার।”ফরমে উল্লেখিত কিছু প্রশ্নের উত্তর দেয়ার জন্য আন্তরিকভাবে অনুরোধ জানাচ্ছি যা আনুমানিক ২০- ৩০ মিনিট সময় নিবে। আমি আপনাকে অবগত করছি যে,এটাকে কেবল মাত্র আমার অধ্যয়নের সাথে সম্পর্কযুক্ত এবং অন্য কোন উদ্দেশ্যে ব্যবহার হবে না।আমি আপনাকে আরো নিশ্চয়তা প্রদান করছি যে সকল তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে এবং এই তথ্যের উৎস অপ্রকাশিত থাকবে।এমনকি গবেষণাটির শেষে এই সকল তথ্য নষ্ট করে ফেলা হবে।এই অধ্যয়নে আপনার অংশগ্রহন স্বেচ্ছাপ্রণোদিত এবং আপনি যেকোনসময় এই অধ্যয়ন থেকে কোন নেতিবাচক এবং ফলাফল কোন বিরতবোধ ছাড়াই নিজেকে প্রত্যাহার করতে পারবেন। এছাড়াও কোন নির্দিষ্ট প্রশ্ন অপছন্দ হলে উত্তর না দেয়ার এবং সাক্ষাৎকারের সময় কোন উত্তরনা দিতে চাওয়ার অধিকার আপনার আছে। যদি আপনার এই গবেষণা সম্পর্কে কিছু প্রশ্ন করার থাকে অথবা একজন অংশগ্রহনকারী হিসেবে এটা আপনার অধিকার , তাহলে আপনি গবেষক মোঃ গৌরব হাসান ,অথবা এহসানুররাহমান ,সহকারী অধ্যাপক ফিজিওথেরাপী বিভাগ , বিএইচপিআই , সাভার , ঢাকা – ১৩৪৩ এই ঠিকানার সাথে যোগাযোগ করতে পারেন।

এই সাক্ষাৎকার শুরু করার আগে আপনার কি কোন প্রশ্ন আছে ?

আমি আপনার অনুমতি নিয়ে এই সাক্ষাৎকার শুরু করতে যাচ্ছি ?

হ্যাঁ না

সাক্ষাৎকার প্রদানকারীর স্বাক্ষর..... তারিখ

সাক্ষাৎকার গ্রহনকারীর স্বাক্ষর তারিখ

সাক্ষীর স্বাক্ষর তারিখ

পর্ব-ক (আর্থ সামাজিক সম্পর্কিত প্রশ্ন)

ক্রমিকনং	প্রশ্ন	কোড
১	আপনার বয়স কত বছর হিসেবে?	১৮-৩০বছর=১ ৩১-৪২বছর=২ ৪৩-৬০বছর=৩ ৬১-৭০বছর=৪
২	লিঙ্গ	মহিলা =১ পুরুষ=২
৩	আপনার বৈবাহিক অবস্থা ?	বিবাহিত=১ অবিবাহিত=২
৪	আপনার শিক্ষাগত যোগ্যতা?	প্রাইমারী থেকে কম =১ প্রাইমারী সম্পূর্ণ =২ এসএসসি সম্পূর্ণ=৩ এইসএসসি সম্পূর্ণ=৪ স্নাতক=৫
৫	আপনার ধর্ম কি ?	মুসলমান=১ হিন্দু=২
৬	আপনার পেশা কি?	গৃহিণী=১ চাকুরিজিবি=২ অন্যান্য=৩
৭	আপনার পরিবারের মাসিক আয় কত?	৫০০০=১ ১০০০০-১৫০০০=২ ২০০০০-২৫০০০=৩ >২৫০০০=৪
৮	জীবনের বেশিরভাগ সময় আপনি কোথায় বাস করেছেন?	শহরঅঞ্চল=১ গ্রামঅঞ্চল=২

পর্ব-খ (শ্বাসতন্ত্রের জটিলতা সম্পর্কিত প্রশ্ন)

ক্রমিকনং	প্রশ্ন	কোড
৯	আপনি কি কখনো শ্বাসতন্ত্রের জটিলতাই ভুগেছিলেন?	না=১ হা=২ প্রযোজ্য নয়=৩
১০	আপনার কি কাশি ছিল সার্জারি পরে?	না=১ হা=২ প্রযোজ্য নয়=৩
১১	আপনি কি বৃকে জড়তা অনুভব করেতেন সার্জারির পরে?	না=১ হা=২ প্রযোজ্য নয়=৩
১২	আপনার কি নিওমোনিয়া হয়েছিল সার্জারির পরে ?	না=১ হা=২ প্রযোজ্য নয়=৩
১৩	আপনার কি কাশির সাথে রক্ত আসত সার্জারির পরে?	না=১ হা=২ প্রযোজ্য নয়=৩
১৪	আপনি কি অ্যাটেলেকটেসিস এভুগেছিলেন সার্জারির পরে ?	না =১ হা=২ প্রযোজ্য নয়=৩
১৫	আপনার কি কান্সার হয়েছিল সার্জারির পরে?	না=১ হা=২ প্রযোজ্য নয়=৩
১৬	আপনার কি পুঁজ হয়েছিল সার্জারির পরে?	না=১ হা=২ প্রযোজ্য নয়=৩
১৭	আপনার কি গলা চাপ ধরে আসত সার্জারির পরে?	না=১ হা=২

		প্রযোজ্য নয়=৩
১৮	আপনার কি শ্বাসকষ্টে ভুগেছিলেন সার্জারির পরে?	না=১ হা=২ প্রযোজ্যনয়=৩
১৯	আপনার কি টিবি হয়েছিল সার্জারির পরে?	না=১ হা=২ প্রযোজ্যনয়=৩

পর্ব-খ (ঝাঁকির কারন সম্পর্কিত প্রশ্ন)

২০	আপনি কি নিয়মিত ধূমপান করতেন?	না=১ হা=২ প্রযোজ্যনয়= ৩
২১	আপনার কি কোন ধরনের বুকের সমস্যা ছিল বা কোন ধরনের অপারেশান করেছেন?	না=১ হা=২ প্রযোজ্যনয়= ৩
২২	আপনি কি নিয়মিত ধোঁয়া অথবা নোংরা পরিবেশের সম্মুখীন হয়েছেন?	না=১ হা=২ প্রযোজ্যনয়= ৩
২৩	আপনি কি নিয়মিত শারিরিক ব্যায়াম করতেন?	না=১ হা=২ প্রযোজ্যনয়= ৩

২৪	আপনার পরিবারের কারো শ্বাসতন্ত্রজনিত কোন সমস্যা আছে?	না=১ হা=২ প্রযোজ্য নয়= ৩
২৫	আপনার শ্বাসতন্ত্রের সমস্যার জন্য কি আপনি ফিজিওথেয়ারপি চিকিৎসাগ্রহন করেছিলেন?	না=১ হা=২ প্রযোজ্য নয়= ৩

CONSENT FORM (English)

(Please read out the participants)

Assalamu-alaikum / Namasker. My name is Md. Gourab Hasan, student of B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI), CRP. I am conducting a study for partial fulfillment of Bachelor of Science in Physiotherapy degree, titled, "Prevalence of postoperative pulmonary complication following thoracic surgery".

You will need to answer some questions which are mentioned in this form. It will take approximately 20-30 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. All information provided by you will keep in a locker as confidential and it will be ensured that the source of information remains anonymous and also all information will be destroyed after completion of the study. Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during interview.

If you have any query about the study or your right as a participant, you may contact with, researcher Md. Gourab hasan or ,Ehsanur Rahman Assistant professor, Department of Physiotherapy, BHPI, CRP, Savar , Dhaka-1343.

Do you have any questions before I start?

So may I have your consent to proceed with the interview?

Yes:

No:

Signature of the Interviewer..... Date

Signature of the participant Date

Signature of the Witness..... Date

PART- A (SOCIO-DEMOGRAPHIC QUESTIONS)

Serial No.	Question	Coding Category
1.	What is your current age? (In years)	1= 18-30 years 2 = 31-42 years 3 = 43-60 years 4 = 61-70 years
2.	Sex	1 = Male 2= Female
3.	What is your marital status?	1 = Married 2 = Unmarried
4.	What is your educational qualification?	1 = less than primary 2 = Primary completed 3 = S.S.C completed 4 = H.S.C completed 5 = \geq Graduation
5.	What is your religion?	1 = Muslim 2 = Hindu 3 = Others
6.	What was your previous occupation?	1 = Housewife 2 = Service holder 3 = Business 4 = Others
7.	What was your total family income per month?	1 = < 5000 TK 2= 10000-15000 TK 3= 20000-25000 TK 4 = >25000 TK
8.	Where you spent most of the time in your life.	1 = Urban area 2 = Rural area

PART- B (RESPIRATORY COMPLICATION RELATED QUESTIONS)

Serial No.	Question	Coding Category
9.	Have you ever experienced any respiratory complication after surgery?	1 = No 2= Yes 3=Not applicable
10.	Do you usually suffer from cough after surgery?	1 = No 2 = Yes 3=Not applicable
11.	Do you suffer from chest tightness after surgery?	1= No 2= Yes 3=Not applicable
12.	Do you suffer from pneumonia after surgery?	1= No 2= Yes 3=Not applicable
13.	Do you suffer from haemoptysis after surgery?	1 = No 2 = Yes 3=Not applicable
14.	Do you suffer from atelectasis after surgery?	1= No 2 = Yes 3=Not applicable
15.	Do you suffer from cancer after surgery?	1=No 2=yes 3=Not applicable

16.	Do you have pus after surgery?	1=No 2=Yes 3=Not applicable
17.	Do you have throat tightness after surgery?	1=No 2=Yes 3=Not applicable
18.	Do you have breathless after surgery?	1=No 2=Yes 3=Not applicable
19.	Do you have TB after surgery?	1=No 2=Yes 3=Not applicable

PART-C (RISK INDICATOR RELATED QUESTION)

Serial No.	Question	Coding Category
20.	Have you ever smoked cigarettes regularly?	1 = No 2 = Yes 3=Not applicable
21.	Have you ever had any other disease condition or chest related operation?	1= No yes = Yes 3=Not applicable
22.	Have ever been exposed regularly to irritating or chemical fume?	1 = No 2= Yes 3=Not applicable
23.	Did you involve any physical exercise?	1 = No 2 = Yes 3=Not applicable
24.	Have your family member ever had any respiratory diseases?	1= No 2 = Yes 3=Not applicable
25.	Did you ever receive physiotherapy treatment for your respiratory problem?	1 = No 2 = Yes 3=Not applicable



বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
BANGLADESH HEALTH PROFESSIONS INSTITUTE (BHPI)

(The Academic Institute of CRP)

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

সিআরপি-বিএইচপিআই/০৩/১৭/৬৬

তারিখ : ২৭.০৩.২০১৭

প্রতি
পরিচালক
ন্যাশনাল ইনস্টিটিউট অব ডিজিস অব দ্য চেস্ট হসপিটাল
ঢাকা।

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

জনাব,

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

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

বিএইচপিআই'র ৪র্থ বর্ষ বিএসসি ইন ফিজিওথেরাপি কোর্সের ছাত্র মোঃ গৌরব হাসান তার রিসার্চ সংক্রান্ত কাজের তথ্য সংগ্রহের জন্য আগামী ০১.০৪.২০১৭ থেকে ১৫.০৫.২০১৭ তারিখ পর্যন্ত আপনার প্রতিষ্ঠানে সফর করতে আহ্বান। তার রিসার্চ শিরোনাম

Prevalence of post-operative pulmonary complications following thoracic surgery at NIDCH

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

ধন্যবাদান্তে

মোঃ ওবায়দুল হক
সহযোগী অধ্যাপক ও বিভাগীয় প্রধান
ফিজিওথেরাপি বিভাগ
বিএইচপিআই, সিআরপি।



Permission letter

March 25, 2017

Head of the Department,
Department of Physiotherapy,
Centre for the Rehabilitation of the Paralysed (CRP),
Chapain, Savar, Dhaka-1343

Subject: Seeking permission of data collection to conduct my research project.

Dear Sir,

With due respect and humble submission to state that I am Mohammad Gourab Hasan, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved my research project entitled on “**Prevalence of post-operative pulmonary complications following thoracic surgery at NIDCH**” under the supervision of Ehsanur Rahman, Assistant Professor, Department of Physiotherapy, BHPI; CRP. Conducting this research project is partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. I want to collect data for my research project from the patient of NIDCH. So, I need permission for data collection from the National Institute of chest Disease and Hospital (NIDCH) mohakhali, Dhaka. I would like to assure that anything of my study will not be harmful for the participants.

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

Sincerely,

Md. Gourab Hasan

Md. Gourab Hasan
4th Professional B.Sc. in Physiotherapy
Roll-26, Session: 2012-2013
Bangladesh Health Professions Institute (BHPI)
(An academic Institute of CRP)
CRP, Chapain, Savar, Dhaka-1343.

Forwarded to Head of
Dept, PT, BHPI
E. Rahman
25/03/17

Allowed
9/25/03/17
Md. Obaidul Haque
Associate Professor & Head of the Department
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343



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

Ref: CRP-BHPI/IRB/04/17/90

Date: 15/04/2017

To
Md.Gourab Hasan
B.Sc. in Physiotherapy
Session: 2012-2013, Student ID 112120027
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: "Prevalence of post-operative pulmonary complications following thoracic surgery at NIDCH."

Dear Md.Gourab Hasan

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application on 16/08/2016 to conduct the above mentioned thesis, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Thesis Proposal
2	Questionnaire (English and Bengali version)
3	Information sheet & consent form.

Since the study involves a self-administered questionnaire that takes 15 to 20 minutes and have no likelihood of any harm to the participants. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 09:00 AM on August 17, 2016 at BHPI.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

Millat Hossain

Muhammad Millat Hossain
Assistant Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh