

ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF MEDICINE

DEPARTMENT OF ANESTHESIA

The prevalence of frailty and its associated factors among preoperative elective elderly surgical patients in selected referral hospitals, Addis Ababa, Ethiopia, 2023/2024: A multi-center cross sectional study.

THESIS SUBMITTED IN THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR MASTER OF SCIENCE IN ADVANCED CLINICAL ANESTHESIA OF ADDIS - ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, SCHOOL OF MEDICINE, DEPARTMENT OF ANESTHESIA

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Title	The prevalence of frailty and its associated factors among preoperative elective elderly surgical patients in selected referral hospitals, Addis Ababa, Ethiopia, 2023/2024: A multi-center cross sectional study.
Study period	From February1/2024 to April 30/ 2024
Study area	Four referral Hospitals in Addis Ababa Ethiopia: Tikur Anbessa Specialized Hospital (TASH),St,Paulos Referral Hospital, Zewditu Memorial Hospital and Yekatit12 Hospital
Study Budget	A total of 24,578 birr
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Declaration

I, the undersigned, declare that this thesis is my original work in partial fulfillment of the requirements for the Master of Science degree in Anesthesia. I understand that plagiarism will not be tolerated and all directly quoted material has been appropriately referenced.

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ABSTRACT

Background: Frailty is a phenotype that identifies people with reduced physiological reserve in multiple organ systems. The prevalence of frailty in surgical patients ranges from 4.1% to 50.3%. Frailty can leads to infection, increase healthcare intervention and hospitalization in elderly surgical patients. Thus preoperative identification of factors causing frailty is critical for determining patient suitability for surgery.

Objectives: To assess the prevalence of frailty and its associated factor in preoperative elderly surgical patient at Addis Ababa referral hospitals, Ethiopia from February –April 2024.

Method: A multi-center cross sectional study was conducted on 422 elderly surgical patients in selected referral hospitals in Addis Ababa, Ethiopia from February-April 2024. The data was collected after obtaining consent, and the study participants were chosen using a method of systematic random sampling. Data was checked, coded, entered, and analyzed by using Statistical Package for Social Science version 26. Multinomial logistic regression analyses were performed to identify a statistically significant association between the independent and dependent variables. Finally, variables are significant when their p-value is less than 0.05.

Result: The prevalence of frailty and pre-frailty in elective elderly surgical patients was 23.7% (95% CI: 19.7% to 28%) and 35.1% (95% CI: 30.5% to 39.8%), respectively. Sex (AOR: 2.326, 95%CI: 1.112–4.863), age (AOR:2.308, 95%CI:1.120–4.574), depression (AOR:2.747, 95%CI:1.295–5.826), presence of more than two coexisting disease (AOR:9.049, 95%CI:1.633–50.147) and use of more than two medications (AOR:7.320, 95%CI:1.884–28.450) were found to be significantly associated with frail and sex(AOR:1.733, 95%CI 1.034-2.906)and residence (AOR:1.996, 95%CI:1.162–3.429) were found to be significantly associated with pre-frail

Conclusion and recommendation: More than 1/5th of surgical patients were frail, and more than 1/3rd of surgical patients were pre-frail. Patient age, sex, depression, the presence of co-existing disease, and medication usage were identified factors of frailty. Pre-frailty, on the other hand, was linked to patient sex and residence status. Early assessment and pre-rehabilitation of elective elderly surgical patients with depression, coexisting disease and those who uses more than two medications, before surgery is recommended and may lead to a good surgical outcome.

Key words: Frailty, elderly, elective, surgery

List of abbreviations and Acronyms

ADL …….Activity of Daily Living

AOR ……. Adjusted odd ratio

CCI ……..Charlson Co morbidity Index

CFS …….Clinical Frailty Scale

CRP ……C reactive protein

EMS …… Emergency surgery

FI ……. Frailty Index

FRAIL…… Fatigue, Resistance, Ambulation, Illness and Loss

HAD ……Hospitalization-Associated Disability

IL-6 …….Interluekin-6

LOS……. Length of Hospital stays

MNA-SF……..Short-Form Mini-Nutritional Assessment

POD…….Post-operative Delirium

POSSUM……Physiological and Operative Severity Score for the enumeration Of Mortality and Morbidity

PRISMA……Preferred Reporting Items for Systematic Reviews and Meta-Analyses

TNF-α ……Tumor Necrosis Factor- Alpha

UK…….United Kingdom

USA…….United State of America

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CHAPTER ONE

1. INTRODUCTION

1.1 BACKGROUND

The concept of frailty appeared in geriatric medical literature in the 1950s and 1960s for the first time, followed by a substantial body of contributions in the 1980s and 1990s(1).Frailty is most common in elderly patients, obviously, the average age of patients receiving surgery will rise rapidly as well(2). Frailty is defined as a multidimensional clinical syndrome and it is age associated decrease homeostatic, physiologic reserve and function of multiple organ system and it is characterized by diminished ability to get better from stressors caused by an age-related decrease in reserve (3-5).

The cross-sectional study conducted in China show that the prevalence of frailty in preoperative elderly surgical patients was 43.8% (6). Another study has reported that the prevalence of frailty among surgical patients in Italy frailty were 19% and pre-frailty were 34%(7).A cross-sectional study conducted by Biritwum RB et al at Ghana Accra in six nations, among community dwellers, the age-standardized prevalence of frailty in older adult was 30.8% in the Russian Federation, 56.9% in India, 38.0% in South Africa, 37.9% in Ghana, 30.4% in Mexico, and 13.5% in China(8). In our country, the prevalence of frailty among community dwellers and older adults in Gondar City was 39% (9).

The pathophysiology of frailty continues to be elucidated, and two major areas are the role of a pro-inflammatory state and the link between inflammation and endocrine systems(10).Aging is associated with changes in the immune system, including immunosenescence, characterized by an altered distribution of cytokine-secreting T-cells and higher levels of cytokines secreted by adipose tissue(11).Elevated markers of inflammation, including IL-6(Interluekin6), TNF-α (Tumor Necrosis Factor Alpha), and CRP (C Reactive Protein), have been found in frailty populations and are associated with the stigma of frailty. For example, IL-6 has been associated with the development of sarcopenia, anemia, and insulin resistance(11, 12). The higher sensitivity of frail elderly patients to anesthetic drugs compared to non-frail patients can be attributed to a number of factors, including reduced brain and blood volume, decreased cortical

volume, decreased number of anesthetic drug-binding sites (e.g., GABA receptors, NMDA receptors), and decreased number and function of neuronal synapses(13-16).

Frailty has clinical implications for older individuals considering surgery which is increase perioperative and post operative complication as well as increase length of hospital stay and the proportion of patients requiring any health care intervention after discharge was greater in the frail group than in the non frail group (17-22). Preoperative risk assessment is critical for determining patient suitability for surgery and identifying patients at greater risk of intraoperative and postoperative complications (21).

Frailty progression increases the demand for health resources, and frailty raises healthcare expenses, primarily owing to hospital admissions. Even though costs are context-specific and thus vary greatly among nations and healthcare financing systems, it can be generally accepted that healthcare costs are around 2.5-fold higher for frail individuals as compared to non-frail individuals (23). The Clinical Frailty Scale (CFS) and the FRAIL (Fatigue, Resistance, Ambulation, Illness and Loss) scale are the most frequently used frailty screening measures. However, few studies have examined different frailty screening and evaluation techniques in the same cohort of inpatient patients, particularly those from different wards (24).

Studies of geriatric medical patients suggest that exercise training can improve frailty and functional outcomes in frail individuals. In general, high-intensity exercise seemed to be most effective, and the ideal duration of the exercise program was not well investigated, but programs of longer duration and 3× week 30–45 minutes/session tended to have better outcomes(25).The role of pharmaceuticals to prevent or modify frailty is less clear. A potential idea for improving health before surgery is prehabilitation for frail individuals (26).

1.2 STATEMENT OF THE PROBLEM

Over the last 20 years, the number of older people undergoing surgical procedures has increased faster than the rate of population aging(27). However, Ethiopia has a dearth of research on frailty in elderly surgical patients despite there is an improvement in the demand for access to surgical service. There is only one study conducted in Gondar which found a prevalence of 39% of frailty among community dwellers and older adults (9).

The prevalence of frailty among older adults living in communities across various nations ranged from13.5% to 56.9%(28), and In China, the prevalence of frailty among preoperative elderly surgical patients was reported at 43.8%(6), In Italy, frailty was found to affect 19% of the population, while pre-frailty was observed in 34%(7).

Previous studies have shown that; age, co-morbidity, being a poly pharmacy, depression, low hand grip strength and low exercise habits were risk factors for frailty in elderly surgical patients(6, 7, 9).The frequency and severity of adverse drug events are higher in individuals who are frail due to the use of medications and possible alteration in pharmacokinetics and pharmacodynamic effect(29).

When frailty is present before surgery, the adjusted rates of morbidity and mortality increase by at least twofold. Additionally, the odds of delirium and loss of independence increase by more than four and fivefold, respectively. Moreover, the nature and timing of the association between frailty and adverse outcomes are also significant factors to consider (30, 31). As a result, care should focus on documenting and communicating individualized risk.

Frail patients exhibited a heightened incidence of cardiac arrhythmias, congestive heart failure, paralysis, and various neurological issues, renal failure, coagulopathy, and fluid and electrolyte imbalances. Additionally, they incurred greater inpatient costs and experienced a 3.13-day longer length of hospital stay (LOS) compared to non-frail patients (23, 32). Elderly surgical patients need early diagnosis and management because frailty is prevalent in older adults and has many negative effects on the elderly surgical patients(33).

Frail older adults who are exposed to smaller external stimuli may experience a series of negative clinical events, such as falls, infections, incapacitation, hospitalization, and risk of death, but certain interventions may delay or even reverse the frailty(20).

Frailty leads to alterations in both pharmacokinetics and pharmacodynamics, impacting how the body processes and responds to anesthetic drugs. Consequently, frail patients often necessitate lower doses of anesthetic agents due to reduced drug metabolism and clearance, thereby mitigating the risk of overdose and adverse reactions (34, 35).

Elderly surgical patients need early diagnosis and management because frailty is prevalent in older adults and has many negative effects on the elderly surgical patient, these includes: increase intra-operative risk, higher incidence of surgical complications and postoperative mortality (32, 36-39). So, screening and identification of frailty and geriatric syndromes in the preoperative setting is crucial for predicting negative outcomes.

However, to our best knowledge, there is little known about the prevalence of frailty in elderly surgical patients and the risk factors of frailty in our setup. Therefore, the aim of this study was to investigate the prevalence of preoperative frailty in elderly surgical patients and further explore the factors that were associated with frailty in this population.

1.3 JUSTIFICATION OF THE STUDY

Frailty in elderly surgical patient will increase the incidence of intraoperative complication and events, increase intraoperative requirement of blood transfusion, and vasopressors leads to hypotension, postoperative delirium and post operative length of hospital stay (38, 39). The reported prevalence of frailty is high and as surgical patients are getting older, they have complicated issue(7). Despite the vast variance in prevalence, moderate to severe frailty remained an independent predictor of mortality, prolonged length of hospital stay, and admission to a hospital for up to one year (31, 40).

However, in Ethiopia and Africa, there are only a limited number of studies. In addition, few studies have examined different frailty screening and evaluation techniques in same cohort of inpatients.

To the best of our search and knowledge, there has been no study conducted on frailty and its associated factors in elderly surgical patients in our country, Ethiopia. Therefore, assessing the prevalence and associated factors of frailty will help health professionals identify frail patients early and make decisions regarding their care. In addition, this study will help anesthesia providers determine factors associated with frailty, helping them to be proactive in recognizing frailty, risk stratifying older frail surgical patients, and identifying as well as optimizing modifiable factors during preoperative preparation.

Thus, determining the prevalence and factors associated with frailty in elderly patients undergoing surgery will help to reduce patient morbidity and mortality, and it will improve the positive surgical outcome. This research will also serve as baseline research, a guide for future research, and a valuable resource for other researchers.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Prevalence of frailty of elderly patient

The definition of frailty encompasses a loss of biological reserves, malfunctioning physiological systems, a reduced stress tolerance due to age-related decline in reserve, and susceptibility to various unfavorable consequences (41). There are different frailty assessment tools encompassed in the different studies consist of the Fried phenotype, Clinical Frailty Scale, Gerontopole frailty screening tool, Time Up and Go test, FRAIL and Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)(42).

The prevalence of frailty in patients of all ages presenting for surgical procedures is quoted at between 4.1 and 50.3% because various studies have used different frailty measurement tools. (43). Different studies were done in different European countries on prevalence of frailty among elderly surgical patients in Italy, frailty was found to affect 19% of the population, while pre-frailty was observed in 34%(7) and in Spain the prevalence of pre-frail and frail was 33.8% and 20.3% among older patients in primary health centers(44).

Similarly; different cross-sectional studies were done in different Asian countries on prevalence of frailty in surgical patients. The prevalence of frailty was seen 30.8% among patients undergoing emergency abdominal surgery in China. The overall death rate was 15.68% (45). A systematic review and meta-analysis conducted in the Department of Population Health at the University Of Oxford, UK, showed that frailty was frequent in the older, unselected acute hospital group, with an estimated median prevalence of roughly 40% (40).

The cross-sectional study conducted in China showed that the prevalence of frailty was 32.3% (Fried), 36.2% CFS, 19.2% FRAIL, 25.2% (Edmonton), and 35.1% FI (frailty index) in all patients (24). Qianqian Zhang and his colleague in Chinese, from March 2020 to November 2020, conducted a cross-sectional study on the prevalence and risk factors of preoperative frailty in elderly patients with gastrointestinal cancer undergoing Surgery showed that the prevalence of frailty in elderly patients with gastrointestinal cancer was 43.8%(6). In another study done on Saudi community-dwelling older adults, the prevalence of pre-frailty and frailty was 47.3 and 21.4%, respectively (46).

Different studies are also available in our continent; in South Africa the prevalence of frailty in age above 18 year surgical patients were 22% (39). In our country, the prevalence of frailty among community dwellers and older adults in Gondar City was 39% (9).

2.2 Factors Associated with frailty elderly patient

Different studies have been done regarding socio-demographic characteristics in association with frailty. Age is strongly associated with frailty and pre-frail. Increase age is strongly associated with frailty (47). Increasing age and the physiologic changes that occur with aging may contribute to sarcopenia, resulting in a in a greater risk for frailty (48, 49). Polypharmacy (taking 3 or more medication at same time)(50, 51). Frailty and pre-frailty among older adults with asthma in northern China were linked to specific factors: female gender, illiteracy, low economic status, co morbid chronic diseases, previous hospitalization within the past year, and residing in rural areas (47).

A study conducted by Chun-Yi Tsai et al. (association of preoperative frailty and postoperative delirium in older cancer patients undergoing elective abdominal surgery between September 2016 and November 2018 at a medical center in Taiwan) found that frail condition deficiencies in patients with malnutrition, co-morbidity, and functional status were the three most common deficit frail conditions, while mood, cognition, social support, and falls were the three least common deficit frail conditions. This study's results showed postoperative delirium (POD) prevalence was substantially related to the demographic of older cancer patients who presented with an elevated number of frail state deficits (52). Another study conducted in Saudi community dwellers showed that associated factors of frailty were age, living alone, more chronic condition and cognitive impairment associated factors of frailty (46).

Another study conducted by Aalam Sohal et al. in the USA found that, in comparison to non-frail patients, frail patients had a higher incidence of cardiac arrhythmias, congestive heart failure, paralysis, various neurological problems, renal failure, and coagulopathy. Fluid and electrolyte imbalances affected more than 80% of frail individuals. There was no statistically significant difference in the incidence of obesity or cancer between the two groups. A larger proportion of extra interventions were required in intraoperatively frail patients than in non-frail patients, such as blood transfusions and esophagogastroduodenoscopy (32).

A cross sectional study conducted in Spain among older patients in primary health care observed that pre-frail individuals, in comparison to their non-frail counterparts, exhibited advanced age, a higher prevalence of co-morbidities, and lower socioeconomic status. Additionally, frail individuals, when compared to non-frail individuals, demonstrated a higher likelihood of being female, older, having more co-morbidity, and having lower income levels. Furthermore, the review highlighted that frail individuals, in comparison to pre-frail individuals, were more commonly female, older, and had a higher burden of co-morbidities (44).

If minor or major complications occurred, costs increased after correcting for age, co-morbidities, and preadmission function as frailty and the American Society of Anesthesiologists score increased. Frailty identification represents an opportunity to target risk-reduction measures and interventions to enhance outcomes while lowering costs(53). A prospective observational cohort study conducted in Germany found that among 701 participants, a higher median FI was seen in orthopedic patients than in cardiac surgery patients and in women than in men(37).

In a population-based cross-sectional study conducted in Sri Lanka, age was strongly associated with both frailty and pre-frailty status. Additionally, significant correlations were identified between the longest-held occupation and frailty, as well as education level and pre-frail (54). A cross-sectional study conducted in Italy among elderly surgical patients found that physical impairment, co-morbidity burden, cognitive dysfunction, and dependence on activities of daily living largely characterize frailty(7).

According to a cross-sectional study on the prevalence and perioperative complications of surgical patients done in South Africa, patients with multiple co-morbidities, an ASA-PS score of ≥3, and an older age were much more likely to be frail (55).A community-based cross-sectional study conducted among community dwellers and older adults living in Gondar town showed that frailty in older persons is significantly associated with age 80 and older, having two or more morbidities, being Activity of Daily Living (ADL), being dependent, and experiencing depression. According to the findings of this study, those who had at least two co-morbidities were 6.05 times more likely to become frail than those who did not. Furthermore, those with ADL dependence were 4.12 times more likely to develop frailty than participants without ADL dependence *(9)*.

2.3 Conceptual frame works

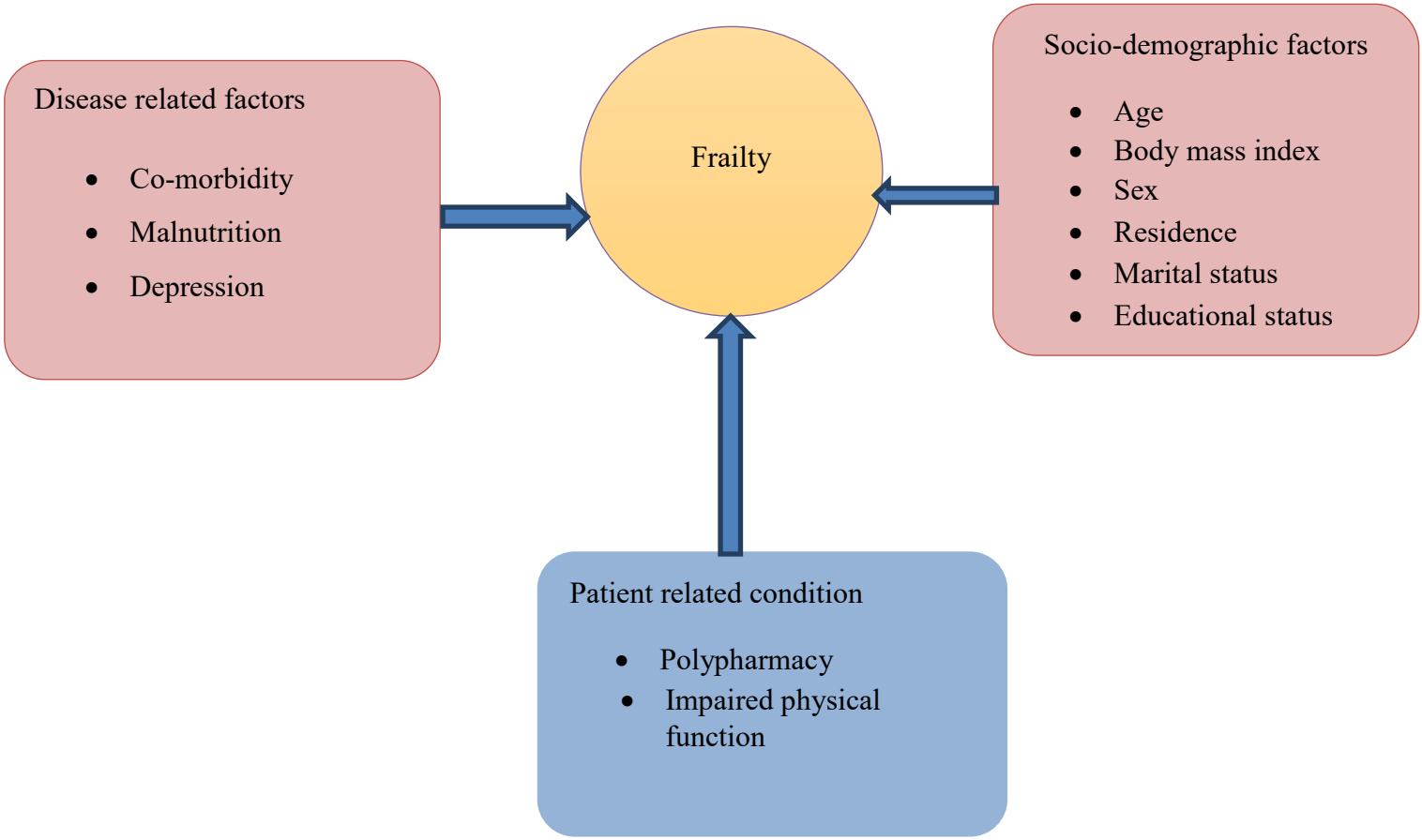


Figure 1: Conceptual framework showing factors affecting frailty of elderly surgical patients (9, 32, 56)

CHAPTER THREE

3. Objective

3.1 General objective

- To assess the prevalence of frailty and its associated factors in pre-operative elective elderly surgical patients at Addis Ababa referral hospitals in Addis Ababa, Ethiopia, from February 1 –April 30/2024.

3.2 Specific objective

- To determine the prevalence of preoperative frailty among elective elderly surgical patients undergoing surgery at Addis Ababa referral hospitals.

- To identify associated factors of frailty in preoperative elective elderly surgical patients at Addis Ababa referral hospitals.

CHAPTER FOUR

4. Methods and materials

4.1 Study area

This study was conducted in Addis Ababa, the capital city of Ethiopia. The average elevation of the city is 2400 meters above sea level. The current metro area population of Addis Ababa city has a total population in 2024 is 5.7 million (5,704,000)(57). Four referral hospitals were selected purposely based on patient flow and number of elective elderly surgical procedures performed after institutional analysis, namely, Yekatit 12 Hospital, St. Paul's Hospital Millennium Medical College, Empress Zewditu Memorial Hospital, and Tikur Anbessa Specialized Hospital.

St. Paul's Hospital was built in 1969 by Emperor Haile Selassie in collaboration with the German Evangelical Church, to provide medical care for low-income populations. Currently the college has more than 2800 clinical, academic, administrative and support staff that provide medical specialty services to patients who are referred from all over the country, teaching medicine and nursing students and conducting basic and applied research. While the inpatient capacity is more than 700 beds,

Tikur Anbessa specialized hospital is the largest multi-specialist tertiary care referral and teaching hospital in Ethiopia, opened in 1972. TASH is now the main teaching hospital for clinical and preclinical trainings in most disciplines. It is also an institution where specialized clinical services that are not available in other public or private institutions are rendered to the whole nation. It has 694 clinical and 950 non-clinical staff. It has 800 beds, 12 operation theatres, 6,000-8,000 operations done annually.

Yekatit 12 hospital was formed in 1923 as one of the modern medical delivery centers in Ethiopia. It was decided to become a medical college by the city government of Addis Ababa in 2011. It has 8 operating rooms in which 4000-5000 operations are done annually.

Empress Zewditu Memorial Hospital, one of the government hospitals located in Kirkos sub city wereda 08, Addis Ababa, Ethiopia. The hospital was built by the non-governmental organization but changed to the public in 1976E.C. currently; the hospital is governed by ministry of health. It

gives services in different specialties: including general surgery, obstetrics, gynecology, neurology and plastic surgery. The hospital has 7 major operation rooms.

4.2 Study design and Period

A multi-center Cross-sectional study was conducted in fours elected referral hospital in Addis Ababa, Ethiopia, from February1-April 30/2024

4.3 Population

4.3.1 Source population

All elderly patients who were undergoing elective surgery at selected Addis Ababa referral hospitals.

4.3.2 Study population.

Elective elderly surgical patients who underwent surgical procedures at the selected referral hospitals during the study period and fulfill inclusion criteria.

4.4 Inclusion and exclusion criteria

4.4.1 Inclusion criteria

Patients over the age of 50 who were undergoing elective surgery were included in the study (41, 58, 59).

4.4.2 Exclusion criteria

Psychotic patients, unconscious patients, and patients with neurological deficit were excluded from study (22, 37, 60, 61).

4.5 Sample size determination and sampling technique

4.5.1 Sample size

To calculate the sample size, a single population proportion formula is used. The p values of 50% was used in this study to calculate the sample size because no study had been conducted in Ethiopia or Africa before this study on the prevalence and associated factors of preoperative frailty among the elderly patients undergoing elective surgery.

Sample size $(n) = \frac{(z\alpha/2)^2 \rho(1-\rho)}{\varepsilon^2}$ Where p= 50% from q= 50% rule, z= 1.96, and ε= 0.05

n = $\frac{(1.96)^2 0.5(1-0.5)}{0.05^2}$= 384, and 10% of the additional sample is included by assuming loss to follow up384*10%=38=384+38=422

4.5.2 Sampling techniques and procedure

A situational analysis was performed on the three-month recorded notebook of elective elderly surgical patients aged above 50 in selected study hospitals. 290 patients from Tikur Anbessa Specialized Hospital, 205 patients from St. Paul's Hospital, 150 patients from Zewuditu Memorial Hospital, and 200 patients from Yekatit 12 Hospital were undergoing elective surgery during the course of three months.

Therefore, these 845 cases were undergoing elective surgery, in three-months. The participants were selected using a systematic random sampling technique. The total sample sizes of 422 study participants were allocated proportional to each of the selected hospitals for elective elderly surgical patients. The study participants for each selected study hospitals were also selected using a systematic random sampling technique using the daily operation schedule lists as sampling frame and type of surgery were selected lottery method. The first case was selected by lottery method from the daily list of operation schedule, and every two patients were chosen for each of the study hospitals.

Proportional allocation formula:

nh=n*Nh/N where: nh is the sample size allocated in each hospital

Nh is the number of elective elderly surgical patients in the hospitals.

N is the total number of elderly elective surgical patients in the selected hospitals.

n is total sample size

The K^{th} value is determined by N/n=845/422=2

The sample size of each hospital determined by Nh/K^{th}

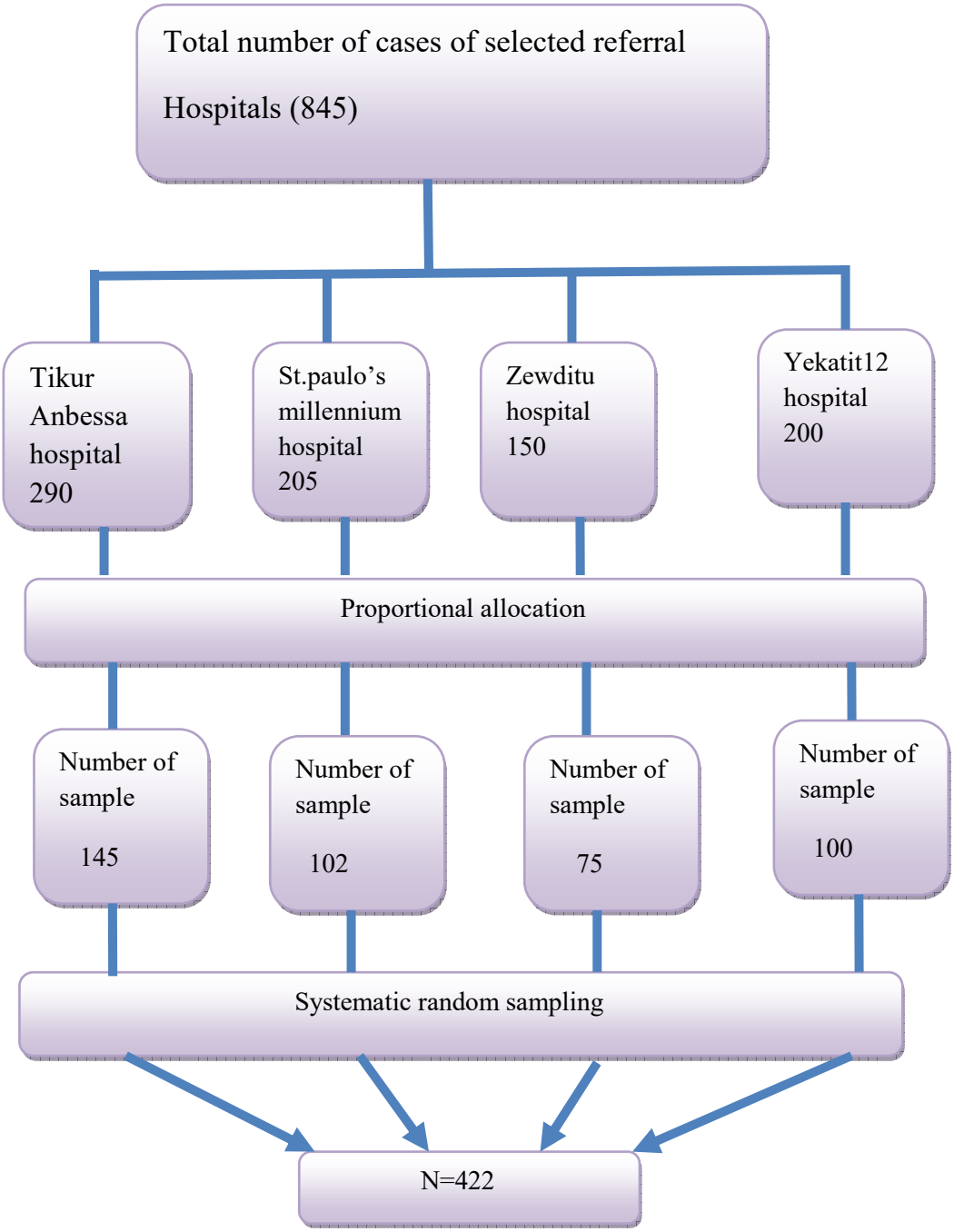


Figure 2Proportional allocations for sample size

4.6 Study variable

4.6.1 Dependent variables

Frailty: (frail, pre-frail and no frail)

4.6.2 Independent variables

Socio-demographic factors

The independent variable of socio-demographic factors of the study includes age, gender, Body Mass Index (BMI), educational level, marital status, residence status, and occupation

Patient clinical factors

The number of co-existing disease including : asthma, hypertension, arthritis, stroke, heart failure, angina, diabetes, chronic obstructive pulmonary diseases, renal impairment, tuberculosis, Myocardial infarction, peripheral vascular disease, Human immunodeficiency Virus, cirrhosis, were variable included under patient clinical factor.

Preoperative associated factors

ASA physical status, the number of medication used, preoperative diagnosis and type of surgery.

Patient behavioral factors

Smoking status, depression, falling history and alcohol consumption status

4.7. Data collection procedure

Data was collected at selected hospitals. Four trained data collector anesthetists collected the data during the pre-operative evaluation of patients. The benefits, risks, objectives of the study and questionnaire were written in English, translated into Amharic, and explained to participants and Patients who do not understand Amharic language were assisted by voluntary translators.

Only those who agreed to participate were enrolled after a brief explanation of the study. During the preoperative evaluation period and in the waiting area for electives, interview-based questionnaires were used to collect data. Patients' characteristics (sex, age, BMI, educational level, marital status, residence status, falling history), number of co-morbidity (cardiovascular disease, heart failure, diabetes mellitus, cirrhosis, stroke, asthma, hypertension, renal failure,

others), type of surgery, ASA physical status, and presence of frailty were collected. The collection of data was done during pre-anesthetic evaluation from the patients.

4.8 Data quality control

To ensure the quality of the data, data collectors were given training on the study's objectives and relevance, as well as brief orientations on the assessment tools. A pretest of the data collection tool (the questionnaire) was performed at Menelik Memorial Referral Hospital and St. Petros Hospital outside of the selected area on 5% of patients who were not included in the main study at the time of data collection to check the validity and reliability of data collection tools and appropriate modification were made to the questionnaires according to the pre-test result before the actual data collection.

During data collection, the investigator reviewed each questionnaire to ensure that it was complete and appropriate. Incomplete data was not entered; data cleaning and crosschecking were performed prior to SPSS analysis.

4.9 Data analysis and interpretation

To check, code, enter, and analyze data, SPSS statistical software version 26 was used. Categorical variables were described using frequency and percentage; the number and percentage of people in each category were presented as categorical data. According to nature of the data, statistical difference between categorical independent variable and dependent variable was tested using chi-square. To define categorical variables, multicollinearity was examined utilizing collinearity diagnosis (Variance Inflation Factor (VIF) was between 1.08 and 5.02) and tolerance was between 0.199 and 0.926) and outlier also checked. Multinomial logistic regression analyses were performed to identify a statistically significant association between the independent and dependent variables. The fitness of the model was assessed by model fitting information and full model were significant improvement over null model[$X^2(70) = 284.099$, $P<0.000$] and goodness of fit contain deviance and Pearson chi-square test. Pearson chi-square test indicate that the model does not fit the data well[$X^2(764) =1176.819$, $p<=0.0005$ whereas the deviance chi-square does indicate good fit [$X^2(764)$] =619.552,$P=1.000$ so the result are somewhat mixed and fit the model. In order to determine the strength of the connection, variables with a p-value of less than 0.2 in bivariable multinomial logistic regression are entered

into multivariable multinomial logistic regression. For each risk factor, the odds ratio (OR) with 95% confidence intervals (CIs) were calculated. A P-value of less than 0.05 is considered statistically significant.

4.10 Operational definition

Frailty: a state of increased vulnerability, result from age associated decline reserve and function across multiple physiology system (1).

FRAIL Scale: is a short five-question assessment that can screen for frailty (62, 63)

1. **Self-reporting fatigues.** How much of the time during the past 4 weeks did you feel tired?
   A. All of the time, B. Most of the time, C. Some of the time, D. A little of the time, E. None of the time.
   If A &B Yes and C, D, E No 1 yes 2 no
2. **Resistance:** By yourself and not using aids, do you have any difficulty walking up 10 steps without resting? 1 yes 2 no
3. **Ambulation**: By yourself and not using aids, do you have any difficulty walking a couple of blocks. 1 yes 2 no
4. **Illnesses**: Hypertension, congestive heart failure, diabetes, angina, Cancer asthma, Arthritis, kidney disease, Stroke, chronic lung disease, heart attack: more than five 1 yes 2 no
5. **Loss of weight**: How much do you weight 1 year ago and current weight, Percent weight change is computed as: [[weight 1 year ago _____Kg(Y)

Current weight _____kg(X)

Y -X /Y*100. If >5%=yes and <5%=no

Scoring: 1. **Robust/no frailty** (0) 2**.Pre-frailty** (**score1**-2) **3**. **Frailty** (**score=3**–5)

Elective surgery: This is a procedure that can be safely planned ahead of time, providing the patients with the most convenient time and location.

Elderly patient: According to the WHO Study on global ageing and adult health, individuals aged 50 and above are considered older adults (59, 64)

4.12. Ethical Consideration

Ethical approval of the research proposal was obtained from the Institutional Review Board (IRB) of the College of Health Science at Addis Ababa University. A formal letter was obtained from the anesthesia department, and an acceptance letter was provided from each hospital to perform the study. Each respondent was informed about the study's goal during the data collection period and agreement was obtained from each of the study participants. Throughout the study, confidentiality and anonymity were preserved.

4.13. Dissemination of result

A hard and soft copy of the final document of this research was given to the anesthesia department, and a presentation will be made to the Addis Ababa University College of Medicine and health science community. Finally, the manuscript will be provided to the Addis Ababa University College of Health science and to each hospital. Additionally, an effort will be made to access the results publicly through publication in reputable journals.

CHAPTER FIVE

Result

5.1 Socio-Demographic variables

This study comprised a total of 422 patients who were scheduled for elective surgery at four Addis Ababa referral hospitals. Of the total participants in the study, 217 (51.4%) were female. Among female participants, the number of patients who were frail, pre-frail, or not frail was 24.9%, 37.8%, and 37.3%, respectively. More than half of the patients—214 (50.7%)—were in the age range between 50 and 65 years, and the remaining 208 (49.3%) were above 65. Among age groups above 65, frail, pre-frail, and no frail were 32.7%, 32.7%, and 34.6%, respectively.

Table 1: Socio-demographic characteristics of elective elderly surgical patients in selected referral hospitals Addis Ababa, Ethiopia from February 1 to April 30/2024

Variable	Categories	Frequency	Percent	No frail (n %)	Pre-frail (n %)	Frail (n %)
Sex	Male	205	48.6%	93(45.4%)	66(32.2%)	46(22.4%)
	Female	217	51.4%	81(37.3%)	82(37.8%)	54(24.9%)
Age	50-65	214	50.7%	102(47.7%)	80(37.4%)	32(15%)
	>65	208	49.3%	72(34.6%)	68(32.7%)	68(32.7%)
BMI	<18.5	53	12.6%	8(15.1%)	18(34%)	27(32.7%)
	18.5-24.9	338	80.1%	151(44.7%)	119(35.2%)	68(20.1%)
	25-29.9	31	7.3%	13(41.9%)	11(35.5%)	7(22.6%)
Residence	Urban	234	55.5%	120(51.3%)	79(33.8%)	35(15%)
	Rural	188	44.5%	54(28.7%)	69(36.7%)	65(34.6%)
Marital status	Married	216	51.2%	96(44.4%)	76(35.2%)	44(20.4%)
	Divorced	76	18%	20(26%)	34(44.7%)	22(28.9%)
	Widowed	130	30.8%	58(44.6%)	38(29.2%)	34(26.2%)
Educational status	Illiterate	195	46.2%	66(33.8%)	65(33.3%)	64(32.8%)
	Primary	83	19.7%	39(47%)	30(36.1%)	14(19.9%)
	Secondary	67	15.9%	30(44.8%)	27(40.3%)	10(14.9%)
	Tertiary	77	18.2%	39(50.6%)	26(33.8%)	12(15.6%)
Occupation	Civil servant	37	8.8%	19(51.4%)	11(29.7%)	7(18.9%)
	Self employed	87	20.6%	45(51.7%)	32(36.8%)	10(11.5%)
	Retired	58	13.7%	23(39.7%)	21(36.2%)	14(24.1%)
	No work	240	56.9%	85(35.4%)	84(35%)	71(29.6%)

5.2 Personal habits and clinical characteristics of the study participants.

Among the participants, 90 (21.3%) were smokers, while 332 (78.7%) were non-smokers, and 149 (35.3%) of the participants were diagnosed with depression. Of those who were diagnosed with depression, 39.6% were frail, 32.4% were pre-frail, and 26.2% were not frail, while 273 individuals (64.7%) showed no signs of depression.

Table2: personal habits and clinical characteristics of elderly elective surgical patients at Addis Ababa referral hospital Addis Ababa, Ethiopia from February 1 to April 30/2024 (n=422)

Variable	Categories	Frequency	Percent	No frail (n %)	Pre-frail (n %)	Frail (n %)
Alcohol habit	Yes	98	23.2%	28(28.6%)	33(33.7%)	37(37.8%)
	No	324	76.8%	174(41.2%)	148(35.1%)	100(23.7%)
Falling history	Yes	67	15.9%	29(43.3%)	22(32.8%)	16(23.9%)
	No	355	84.1.%	145(40.8%)	126(35.5%)	84(23.7%)
Smoking	Yes	90	21.3%	24(26.7%)	30(33.3%)	36(40%)
	No	332	78.7%	150(45.2%)	118(35.5%)	64(19.3%)
depression	Yes	149	35.3%	39(26.2%)	51(34.2%)	59(39.6%)
	No	273	64.7%	135(49.5%)	97(35.5%)	41(15%)
ASA status	ASA I	93	22%	66(71%)	21(22.6%)	6(6.5%)
	ASA II	305	72.3%	107(35.1%)	122(40%)	76(24.9%)
	ASA III	24	5.7%	6(25%)	7(29.2%)	11(45.8%)
Number of medications used	0	123	29.1%	76(61.8%)	41(33.3%)	6(4.9%)
	1	126	29.9%	68(54%)	47(37.3%)	11(8.7%)
	2	92	21.8%	19(20.7%)	38(41.3%)	35(38%)
	>2	81	19.2%	17(21%)	20(24.7%)	44(54.3%)
Number of coexisting Diseases	0	116	27.5%	71(61.2%)	37(32%)	8(6.8%)
	1	146	34.6%	77(52.7%)	55(37.7%)	14(9.6%)
	2	115	27.3%	18(15.7%)	43(37.4%)	54(47%)
	>2	45	10.7%	10(22.2%)	11(24.4%)	24(53.4%)

5.2.1 Type of surgery

The surgery type with the highest number of procedures was urology, accounting for 23.9% of surgeries, while neurology surgery had the lowest number at 5.7%.

Table 3: Type of surgery for elective elderly surgical patients at Addis Ababa referral hospital from February 1 to April 30/2024(n=422)

Variable	Categories	Frequency	Percent	No frail (n %)	Pre-frail (n %)	Frail (n %)
Type of surgery	Cardiothoracic	40	9.5%	9(22.5%)	10(25%)	21(52.5%)
	Neurology	24	5.7%%	10(41.7%)	8(33.3%)	6(25%)
	Orthopedic	46	10.9%	22(47.8%)	16(34.8%)	8(17.4%)
	Urology	101	23.9%	39(38.6%)	37(36.6%)	25(24.8%)
	GI surgery	56	13.2%	30(52.6%)	14(24.6%)	13(22.8%)
	Endocrine	48	11.4%	18(45.1%)	23(31.4%)	7(23.5%)
	GYN	51	12.2%	23(45.1%)	16(31.4%)	12(23.5%)
	Maxillofacial	25	5.9%	11(44%)	8(32%)	6(24%)
	Other	31	7.3%	15(48.4%)	9(29%)	7(22.6%)

5.3 Prevalence of frailty in elderly surgical patients

According to this study the prevalence of frail was 23.7 %(95% CI: 19.7% to 28%) and 35.1 % (95% CI: 30.5% to 39.8%) was pre-frail of elective elderly surgical patient

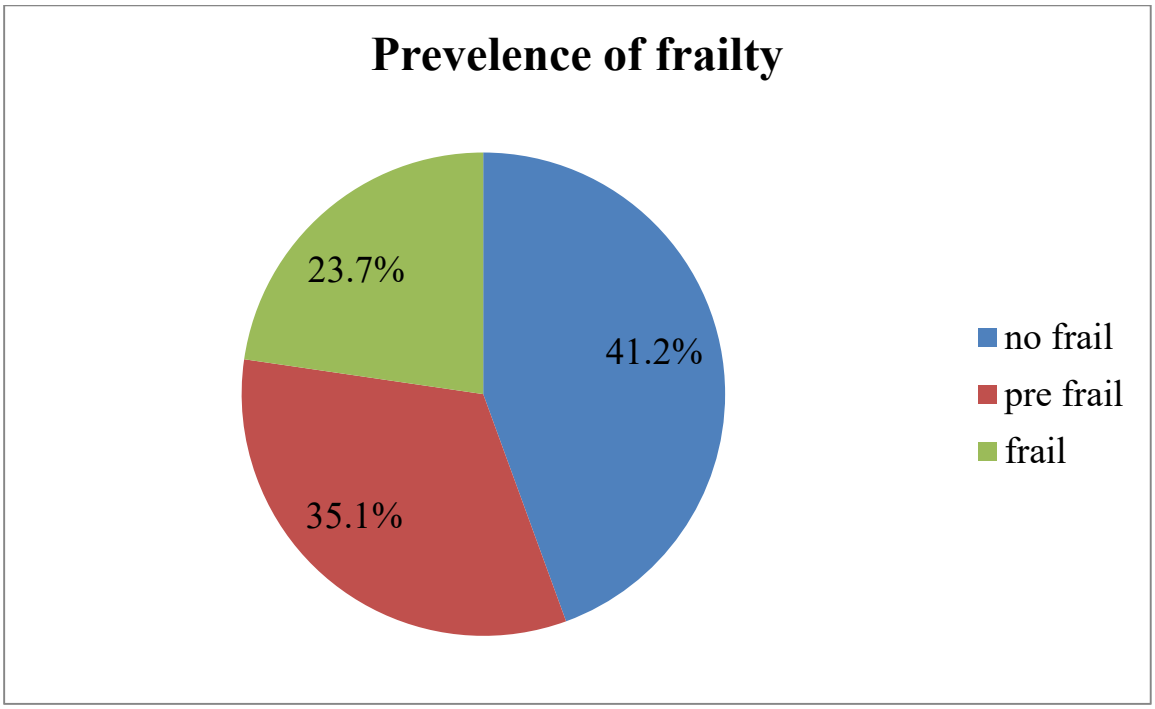


Figure 3: pie chart showing the prevalence of frailty in elective elderly surgical patients scheduled for surgery at patient at Addis Ababa referral hospital from February 1 to April 30/2024(n=422)

5.4 Frailty-related risk factors for elective elderly surgical patient schedule for surgery

Multinomial logistic regression was used to examine the association between frailty, pre-frail and no frail and the independent factors. Bivariate multinomial logistic regression was analyzed; age, sex, BMI, residence, smoking history, alcoholic history, marital status, occupation, education, depression ASA, number of medication used and number of co-existing disease included in multivariate multinomial logistic regression. Sex of the patient, age of the patient, depression, residence, number of coexisting disease and number of medication used were significantly associated with frailty, (Table 4), sex of the patient and residence were significantly associated with pre-frailty, (Table 5).

Frail Versus no frail

Table 4: presents the result of multinomial logistic regression analysis on frailty among elderly surgical patients' public hospital in Addis Ababa.

With no frail as the reference of outcome, the result showed that women were 2.3 times (AOR: 2.326, 95%CI, 1.112–4.863) more likely to be frail than compared with men. Compared with the

age of patients above 65, they were 2.3 times (AOR: 2.308, 95%CI: 1.120–4.574) frailer than those between 50 and 65 years.

Based on residence, patients who came from rural areas were 3.2 times (AOR: 3.263, 95%CI, 1.523–6.991) frailer than patients who came from urban areas. Compared with depression, patients who had depression were more likely to get frail 2.7 times (AOR: 2.747, 95%CI, 1.295-5.826) than patients who didn't have depression.

Compared with the number of co-existing disease, patients who had more than two co-existing disease, were 9 times more likely to frail (AOR: 9.049, 95% CI: 1.633–50.147) than patients who didn't have coexisting disease, and the patient who had two co-existing disease were 7.8 times more likely to frail (AOR: 7.884, 95% CI: 1.914–32.480) than patients who didn't have coexisting disease. Based on the number of medications used, patients who took more than two medications were 7.3 times (AOR: 7.320, 95% CI: 1.884–28.450) frailer than patients who didn't take medication, and patients who took two medications were 6 times more likely to be frailer (AOR: 5.995, 95% CI: 1.661–21.635) than patients who didn't have medication

Pre-frail Versus no frail

Table 4: with no frail as a reference to the outcome, compared with sex of the patient, female patients were 1.7 times more preoperative pre-frail (AOR: 1.733, 95%CI: 1.034-2.906) than compared with men. Patients who came from rural areas were 2 times more preoperative pre-frail (AOR: 1.996, 95%CI: 1.162–3.429) than patients who came from urban areas.

Table 4: Factors related with frail and pre-frail among elective elderly surgical patient at Addis Ababa referral hospital from February 1 to April 30/2024. According to multivariate multinomial logistic regression (n=422)

Variable		Frail Vs No frail AOR(95%CI)	P value	Pre frail Vs no frail AOR (95%CI)	P value
Sex	Male	1		1	
	Female	2.326(1.112-4.863)	0.025*	1.733(1.034-2.906)	0.037*
Age	50-65	1		1	
	>65	2.308(1.120-4.574)	0.023*	1.161(0.702-1.918)	0.561
Marital status	Divorced	0.981(0.342-2.814)	0.971	2.113 (0.983-4.544)	0.055
	Married	1.476(0.642-3.395)	0.360	1.494(0.833-2.679)	0.177
	Windowed	1		1	
Educational status	Illiterate	1.490(0.260-8.551)	0.654	0.778(0.248-2.437)	0.666
	Primary	1.111(0.209-5.898)	0.902	0.902(0.316-2.571)	0.9847
	Secondary	1.978(0.386-10.136)	0.413	1.354(0.521-3.523)	0.534
	Tertiary	1		1	
Occupation	Civil servant	0.645(0.103-4.051)	0.640	0.529(0.153-1.829)	0.315
	Self employed	0.407(0.115-1.440)	0.163	0.671(0.304-1.484)	0.325
	Retired	1.729(0.367-8.141)	0.488	1.065(0.363-3.126)	0.909
	No work	1		1	
BMI	<18.5	2.887(0.736-20.539)	0.110	2.751(0.716-10.567)	0.141
	18.5-24.9	1.514(0.382-6.006)	0.555	1.456(0.553-3.833)	0.447
	25-29.9	1		1	
Residence	Urban	1		1	
	Rural	3.263(1.523-6.991	0.002*	1.996(1.162-3.429)	0.012*
Depression	Yes	2.747(1.295-5.826)	0.008*	1.397(0.786-2.485)	0.255
	No	1		1	
Alcoholic history	Yes	1.886(0.784-4.537)	0.157	1.242(0.626-2.464)	0.536
	No	1		1	
Smoking	Yes	2.312(0.988-5.407)	0.053	1.437(0.730-2.827)	0.294
	No	1		1	
ASA status	I	0.187(0.015-2.384)	0.197	0.212(0.020-2.296)	0.202
	II	0.231(0.024-2.236)	0.206	0.616(0.061-6.226)	0.682
	III	1		1	
Number of medications used	0	1		1	
	1	0.775(0.216-2.773)	0.695	0.777(0.395-1.529)	0.446
	2	5.995(1.661-21.635)	0.006*	1.994.(0.916-4.338)	0.082
	>2	7.320(1.884-28.450)	0.004*	1.133(0.417-3.075)	0.807
Number of coexisting diseases	0	1		1	
	1	1.142(0.292-4.464)	0.848	0.687(0.338-1.394)	0.298
	2	7.884(1.914-32.480)	0.004*	2.220(0.978-5.040)	0.057
	>2	9.049(1.633-50.147)	0.012*	1.413(0.386-5.165)	0.602

* Significant in the multivariate multinomial logistic regressions (p value <0.05) between frail and no frail and between pre-frail and no frail, AOR stands for Adjusted Odd Ratio, CI for confidence interval, 1 for Reference

CHAPTER SIX

6. Discussion

In this paper, we found that the prevalence of frailty and pre-frailty in elective elderly surgical patients was 23.7% and 35.1%, respectively. Our results demonstrate that frailty is a very common problem among elderly patients undergoing surgery.

This finding is comparable with studies conducted in Italy showing that the prevalence of frailty and pre-frailty in surgical patients was 19% and 34%, respectively (7). In a similar study conducted in Spain, the prevalence of pre-frail and frail patients was 33.8% and 20.3%, respectively, among older patients in primary health centers. (44). This might be due to a similar study methodology and measuring tool (FRAIL), and the slight difference might be due to socio-demographic factors, sample size, and patient characteristics. In a separate investigation focusing on surgical patients aged 18 years and above in South Africa, the prevalence of frailty was 22% (60).

Using a frailtyphenotype, another study done in China on older patients undergoing thoracic and abdominal surgery found that the prevalence of frailty was 26.12% in a sample of 245 patients (22). Conversely, our study's frailty prevalence was higher than research done in Sri Lanka (15.2%), and pre-frailty was more common there (48.5%)(54). Similarly, according to a study conducted in China, the prevalence of frailty was 18% lower than this study and pre-frailty was 43% among elderly hospital-admitted patients (65). These discrepancies could be the consequence of various assessment techniques, sample sizes, and sociodemographic characteristics.

On the contrary, the prevalence of frailty among elderly surgical patients in this study was lower than in studies conducted in China which was 30.3% (63) among older adult patients with chronic coronary syndrome, another study conduct in China (43%) among 265 elderly in patient with gastrointestinal cancer undergoing surgery by using Groningen frailty index(6). New Zealand 48.8%(60). Study conducted in Gondar among community dweller older adults living in Gondar town was 39% (9). These differences might happen as a result of the fact that, due to the differences in the content and approach of frailty assessment (inpatient, outpatient, and general practice), sample size and socio-demographic characteristics could potentially account for variations in the prevalence of frailty among this demographic.

We found that there were significant differences in age, sex, residence, number of co-morbidities, number of medications, and depression between frail and non-frail. Additionally, there were significant differences in age, depression, number of co-morbidities, and number of medications between frail and pre-frail, and we found sex of patient and residence were significant between pre-frail and no frail.

Compared to those with increased age, women, and the number of co-morbidities, these findings are entirely consistent with a study conducted in Spain that found that a higher frailty stage was associated with increasing age, women, and the number of co-morbidities(44).

The results of this study showed that in compression frail versus no frail, individuals over 65 had 2.308 times higher odds of getting frail than those between the ages of 50 and 65 [AOR: 2.308, 95%CI (1.120–4.457)]. Several studies have been in line with this result (6, 22, 60, 61). Mechanism showed that increasing age and the physiologic changes that occur with aging may contribute to sarcopenia, resulting in a in a greater risk for frailty (48).

According to this study, elderly female surgical patients had 2.326 times higher odds of getting preoperatively frail than male patients [AOR: 2.326, 95%CI, 1.112–4.863)]. A related study conducted in China on a total of 9996 older patients found that female patients were frailer than male patients(65).The possible postulated mechanisms for females that have been frail were: despite the fact that women are noted to live longer than men, their health may be worse because of environmental factors that contribute to frailty and because lifestyle factors affect women more than men do, making them more susceptible to subcellular mechanisms that lengthen recovery times(66).

In this study, preoperative frailty was 2.747 times more common in patients with preoperative depression than compression in patients who had no preoperative depression. [AOR: 2.747, 95%CI, 1.295–5.726] Several studies have demonstrated that depression is a significant risk factor for the development of frailty among older adults (9, 67). A different mechanism proposed is that behavioral factors like inactivity make depressed people more prone to frailty (68). Furthermore, there's a chance that the two illnesses will have comparable signs and risk factors, like exhaustion, weight loss, insufficient exercise, and cognitive decline (69). Moreover, the two disorders have pathophysiological pathways in common, including inflammation, immunometabolic dysregulation, dopamine deficiency, and mitochondrial dysfunction, (70).

In this study, patients who had more than two co-morbidities during preoperative care were nine times frailer [AOR: 9.049, 95% CI: 1.633–50.147] relative to those with no co-morbidity. There are studies in line with our findings (9, 24, 67, 71, 72). Co-morbidity and frailty are the clinical expressions of two different aging-related processes, namely the buildup of pathogenic processes and a reduction in functional reserve. However, co-morbidity and frailty frequently coexist in older adults, which lower their functional status and quality of life (24, 72).

According to this study, patients who had taken more than two medications during preoperative were associated with being 7.320 times frailer than non-frail patients relative to patients who didn't take a medication preoperatively (AOR: 7.320, 95% CI: 1.884–28.450). There are studies that are familiar with this result (72-74). The possible postulated mechanisms of medication for frailty are drug interactions, increased risk of adverse drug reactions, medication burden, and psychological impact (74, 75).

They found that, with no-frail as a reference to the outcome variable, there was an association between preoperative pre-frail among older women in comparison to male patients; those women had a 1.733 times higher chance of preoperative pre-frail than males (AOR: 1.733, 95%CI: 1.034–2.906). This result is similar to the study done by Zeng Xue-Zhai et al (47). In accordance with the findings of this study, individuals who live in rural areas exhibit a higher prevalence of frailty and pre-frailty compared to their urban counterparts. There are studies familiar with this result (47, 76, 77). The possible mechanisms are due to low socioeconomic status and limited medical resources or accessibility of health services (77).

Chapter seven

7 Strengths and limitation

7.1 strength

Multi center study

Most of the studies conducted on frailty were at the community level; no research was done on elderly surgical patients, so this study identifies the prevalence and associated factors of frailty among elderly surgical patients.

It provides insight and hints about the prevalence and associated factors of frailty for elective elderly surgical patients for future research: As such, studies are limited in our country, Ethiopia.

7.2 Limitation

Biological factors as confounding factors like hormonal level and mitochondrial dysfunction, Elevated levels of inflammatory markers such as C-reactive protein and interleukin have been associated with frailty were not included our study.

Chapter 8

8. Conclusion

In this study, the prevalence of frailty elderly surgical patients was high (23.7%); furthermore, the prevalence of pre-frail was also high (35.1%). The factors associated with frailty in elderly surgical patients were patient age, sex, depression, residence, the presence of co-existing disease, and medication usage and factors associated with pre-frail in elderly surgical patients were patient sex and residence status.

Chapter 9

9. Recommendation

For surgical team and anesthesia

- The prevalence of frailty and pre-frailty is too high, assessing frailty during preoperative evaluation by both anesthetists and surgeons is crucial for optimizing patient surgical outcomes.
- Pre-operative screen of patients who have two or more co-morbidity and patients used two or more medication.
- Treating patient who have co-morbidities and depression before surgery.

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Annex:

Annex-I: consent form

Hello.

My name is_____I am a member of researchers and I have been attending postgraduate program in the field of Anesthesia at Addis Ababa University. I am going to conduct research on assess the prevalence of frailty and its associated factor of preoperative elderly surgical patient selected Addis Ababa referral hospital, Addis Ababa Ethiopia, from February-April, 2024. The information going to be obtained will help the government and other responsible bodies to improve assess the frailty and its associated factor of preoperative elderly surgical patient. Your participation is very valuable for the success of this project. Also be mindful that whatever we will get here is for research purposes only and the information will not be used by any other person apart from this research and therefore, confidentiality can be guaranteed. However, your names will not be mentioned or be attached to anything that you say. Do you want to continue yes---------- No---------- (Thank you in advance for your help!)

Name and contact address of investigator: Semalign Akanie

Mail: semalegn88@gmail.com , phone number: +251919925052

ሀሎ ስሜ _____ እባላለሁ የተመራማሪዎች አባል ነኝ እና በአዲስ አበባ ዩኒቨርሲቲ በሰመመን ዘርፍ የድህረ ምረቃ መርሃ ግብር እየተከታተልኩ ነበር ። ከየካቲት 2024 እስከ ሚያዚያ 2024 ድረስ የደካሞችን ስርጭት እና ተያያዥነት ያላቸውን ከቀዶ ጥገና በፊት አረጋውያን የቀዶ ጥገና ህሙማን ተመርጠው ሪፈራል ሆስፒታል አዲስ አበባ ኢትዮጵያ ከየካቲት 2024 እስከ ሚያዚያ 2024 ድረስ ያለውን የድክመት ስርጭት እና ተያያዥ ምክንያቶችን በመገምገም ጥናት ላካሂድ ነው። ከቀዶ ጥገና በፊት የአረጋውያን የቀዶ ጥገና ታካሚ ደካማነት እና ተያያዥ ምክንያቶችን ለማሻሻል. ለዚህ ፕሮጀክት ስኬት የእርስዎ ተሳትፎ በጣም ጠቃሚ ነው። እንዲሁም እዚህ የምናገኘው ማንኛውም ነገር ለምርምር ዓላማ ብቻ እንደሆነ እና መረጃው ከዚህ ጥናት ውጭ ሌላሰው እንደ ማይጠቀምበት እና ስለዚህ ምስጢራዊነት ሊረጋገጥ እንደሚችል ያስታውሱ። ሆኖም፣ እርስዎ ከሚናገሩት ማንኛውም ነገር ጋር ስምዎ አይነሳም ወይም አይያያዝም።

መቀጠል ትፈልጋለህ/ጊያለሽ፡አዎ---------- አይ---------- (ለእርዳታዎ አስቀድመህ አመሰግናለሁ!)

Annex- II: Research questionnaire

No	Demographic factor	Response		
101	Sex	1. Male 2. Female		
102	Age	_____year		
103	Weight	_____Kg		
104	Height	_____M		
105	BMI(kg/m$^{2)}$	_____kg/m^2		
106	Residence	1. Urban 2. Rural		
107	Alcohol consumption	1. former drinker 2. No drinker 3. Current drinker		
108	Marital status	1.Divorced 2.Married 3.Single 4.Widowed		
109	Educational status	1. Informal unable to read and write 2. Primary 3. Secondary4. Tertiary		
201	Occupation	1.Health worker 4.self-employed 2.Military 5.Retired 3 .Civil servant6.No work		
202	Falling history	1. Yes 2. No		
203	Smoking habits	1. Nonsmoker 2. Smoker 3. Denied		
204	Geriatric Depression Scale			
	A. Are you basically satisfied with your life?		Yes	No
	B. Do you often get bored?		Yes	No
	C. Do you often feel helpless?		Yes	No
	D. Do you prefer to stay at home, rather than going out and doing new things?		Yes	No
	E. Do you feel pretty worthless the way you are now?		Yes	No
	F. Have you dropped many of your activities and interests?		Yes	No
	G. Do you feel your life is empty?		Yes	No
	H. Are you in good spirits most of the time?		Yes	No
	I. Are you afraid something bad is going to happen to you?		Yes	No
	J. Do you feel happy most of the time?		Yes	No
	K. Do you feel you have more problems with memory than most?		Yes	No
	L. Do you think it is wonderful to be alive now?		Yes	No
	M. Do you feel full of energy?		Yes	No
	N. Do you feel that your situation is hopeless?		Yes	No
	O. Do you think most people are better off than you?		Yes	No

B. ***Patient clinical factors***		
205	how many medication you take	1.0 2.I 3.II 4,>II
206	ASA physical status	1. I 2. II 3. III 4. IV
207	How many coexisting disease do you have?	1.I 2.II 3.III 4,IV 5>V
208	preoperative diagnosis	
209	Type of surgery	1. Cardiothoracic surgery 6. GI surgery 2. Neurosurgery 7. Endocrine surgery 3. Orthopedic surgery 8. GYN surgery 4. ENT surgery 9. Maxillofacial surgery 5. urology surgery 10 Hepatobillary surgery 11. vascular sergury Other surgery specify_____

C. FRAIL scale		
301	Fatigue; How much of the time during the past 4 weeks did you feel tired?	1 = All of the time, 3 = Some of the time, 2 = Most of the time, 4 = A little of the time, 5 = None of the time.
302	Resistance; By yourself and not using aids, do you have any difficulty walking up 10 steps without resting?	1. Yes 0. No
303	Ambulation; By yourself and not using aids, do you have any difficulty walking a couple of blocks (e.g. several hundred yards)? 1 yard=0.9144 meter	1. Yes 0. No
304	Illnesses;	1. Hypertension, 6. congestive heart failure 2. Diabetes, 7. angina, 3. Cancer 8. asthma, 4. Arthritis, 9. kidney disease 5. Stroke, 10. chronic lung disease 11. heart attack,
305	Loss of weight : How much do you weight 1 year ago and current weight, Percent weight change is computed as: [[weight 1 year ago _____Kg(Y) current weight _____kg(X) Y-X/Y* 100%. If >5%=yes and <5%=no	1. Yes 0. No

ተ.ቁ	ጥያቄ	መልስ
	ስልክ ቁጥር=	የካርድቁጥር=
101	ጸታ	1. ወንድ 2. ሴት
102	ዕድሜ	_____ ዓመት
103	ክብደት	_____ ኪ.ግ
104	ቁመት	_____ሜ
105	BMI	_____ኪግ/ሜ^2
106	የመኖሪያ አድራሻ	1. ከተማ 2. ገጠር
107	አልኮል መጠጣት	1 .ይጠጣል/ትጠጣለች 2 አይጠጣም/አትጠጣም
108	የትዳር ሁኔታ	1.የተፋታ 2. ያገባ/ች 3. ያላገባ/ች 4.መበለት
109	የትምህርት ደረጃ	1. መደበኛ ያልሆነ ማንበብና መጻፍ የማይችል 2. አንደኛ ደረጃ 3. ሁለተኛ ደረጃ 4. ከፍተኛደረጃ
201	የስራ መደብ	1. የጤና ሰራተኛ 2. ወታደራዊ 3 . ሲቪልሰርቫን ሰራተኛ 4. በራሱ የሚሰራ 5. ጡረታየወጣ 6. ስራየለም።
202	የመውደቅ አደጋ	1አዎ2 የለም
203	ሲጋራ የማጨስልማድ	1. የማያጨስ 2. አጫሽ 3. ተከልክሏል

204	የአዛዉንቶች የመንፈስ ጭንቀት ልኬት	መልስ	
	ሀ. በመሠረቱ በህይወትዎ ረክተዋል?	አዎ	የለም
	ለ. ብዙ ጊዜ ይደብራሉ?	አዎ	የለም
	ሐ. ብዙ ጊዜ የረዳትነት ስሜት ይሰማዎታል?	አዎ	የለም
	መ. ከቤት ወጥተው አዳዲስ ነገሮችን ከማድረግ ይልቅ ቤት ውስጥ መቆየትን ይመርጣሉ?	አዎ	የለም
	ሠ. አሁን ባለህበት መንገድ ቆንጆ እንደሆንክ ይሰማሃል?	አዎ	የለም
	ረ. ብዙ እንቅስቃሴዎች እና ፍላጎቶች ትተዋል?	አዎ	የለም
	ሰ. ህይወትህ ባዶ እንደሆነ ይሰማሃል?	አዎ	የለም
	ሸ. ብዙ ጊዜ በጥሩ መንፈስ ውስጥ ነዎት?	አዎ	የለም
	ቀ. አንድ መጥፎ ነገር በአንተ ላይ እንዳይደርስ ትፈራለህ?	አዎ	የለም
	በ. ብዙ ጊዜ ደስታ ይሰማዎታል?	አዎ	የለም
	ተ. ከብዙዎች ይልቅ የማስታወስ ችግር እንዳለብዎ ይሰማዎታል?	አዎ	የለም
	ቸ . አሁን መኖር የሚያስደስት ይመስላችኋል?	አዎ	የለም
	ኀ. በኃይል እንደ ተሞላ ይሰማዎታል?	አዎ	የለም
	ነ. ሁኔታዎ ተስፋ ቢስ እንደሆነ ይሰማዎታል?	አዎ	የለም
	ኘ.ብዙ ሰዎች ከእርስዎ የተሻሉ ናቸው ብለው ያስባሉ?	አዎ	የለም

ለ. የታካሚዉ የጤና ሁኔታ

ተቁ	ጥያቄ	መልስ
205	ASA አካላዊ ሁኔታ	1. I 2. II 3. III 4. IV
206	ምን ያህል መደሃኒት ይዎስዳሉ?	1. 0 2. I 3. II 4.>II
209	ምን ያህል ተጓዳኝ በሽታዎች አሉ?	1. 0 2. I 3. II 4. >II
301	ቅድመ ምርመራ በሽታዉ አይነት	
302	የቀዶ ጥገና ዓይነት	1. Cardiothoracic surgery 6. GI surgery 2. Neurosurgery 7. Endocrine surgery 3. Orthopedic surgery 8. GYN surgery 4. ENT surgery 9. Maxillofacial surgery 5. urology surgery 10 Hepatobillary surgery 11. vascular sergury

መ. FRAIL ልኬት

303	ድካም፤ባለፉት 4 ሳምንታት ውስጥ ምን ያህል ጊዜ ድካም ተሰምቶህ/ሽ ነበር?	1 = ሁል ጊዜ 3 = አንዳንድጊዜ 5 = አንድም ጊዜ የለም። 2 = ብዙ ጊዜ 4 = ጥቂት ጊዜ፣
305	መቋቋም፤ በእራስዎ/እርዳታ ሳያስፈልግ፣ 10 ደረጃዎች ሳታርፍ መራመድ ይቸገራል?	1 አዎ 2 የለም
306	መንቀሳቀስ፤ በእራስዎ እና እርዳታዎችን አለመጠቀም, ሁለት ብሎኮችን ለመራመድ ይቸገራሉ?	1 አዎ 2 የለም
307	በሽታዎች፤ ተጓዳኝ በሽታዎች አሉ?	1 የደም ግፊት 2. የስኳር በሽታ 7. angina 3 ካንሰር 4 አርትራይተ 8. አስም 5 ስትሮክ 6. የልብ ድካም 9. የኩላሊትበሽታ 10 ሥር የሰደደ የሳንባ በሽታ 11. ድኅተኛ የልብድካም
308	የክብደት መቀነስ፡- ከ1አመት በፊት ክብደትዎ ምን ያህል ነው_____ለ እና የአሁኑ ክብደት_____መ ለ-መ/ለ*100 %በ5% ቀንሰ	1. አዎ 2 የለም

Age categories: age between 50-65 and >65 year (39, 41, 78)

BMI (kg/m2) Description

<18.5 Underweight 18.5–24.9 Normal 25–29.9, overweight 30–34.9 Obesity (class I)

35–39.9 Obesity (class II) ≥40 morbid obesity (class III >50 super obese, From Paul Barash 6th edition