

Evaluation of Frailty among Geriatric Patients in Residents of Aged Care Homes in District Headquarters Using Groningen Frailty Indicator

Jemshy Jolly, Satish S, Shabaraya AR

Department of Pharmacy Practice, Srinivas College of Pharmacy, Valachil, Mangalore

Corresponding Author: Jemshy Jolly

ABSTRACT

Aging is a slowly progressive as well as a continuous process of natural event that starts from early adulthood. In elderly many bodily functions begins to change. WHO defines 'old age' as a 'group of 60 or above'. Many complications of aging can results in frailty. Therefore, Frailty can be defined as a clinical state with an increased rise in individual's vulnerability to develop a negative health related event which can be a disability, hospitalizations, institutionalization and death when exposed to various stress of exogenous or endogenic origin.

The intent of the study was to evaluate frailty among geriatric population using GFI (Groningen frailty indicator). A cross-sectional study was carried out for a period of six months among residents of aged care homes in Kasaragod. Patients, both males and females of 60 years of age, with at least one chronic illness were included in the study. The study draws the conclusion that out of 100 participants, 12 were considered to be completely disabled with a GFI score of less than 4 suggesting a totally confined to bed status.

The prevalence of being frail among elderly population seems to be higher when there occurs a sudden decline in principle care from the family. Therefore evaluation of frailty among the geriatric populations using suitable tools will help in developing individualized effective therapeutic interventions.

Keywords: Elderly, Geriatrics, Frailty, GFI, Interventions

INTRODUCTION

Understanding the etiology behind the vulnerabilities and reduced physiological reserve among elderly populations has always provided a positive impact in bringing the better patient and disease oriented therapeutic interventions. This is because clinically when it comes to geriatric population, principle care remains as the major concern in deciding whether an individual is frail or not. As the cell age, they tend to function less. Aging causes low bone density making them more prone to break. In females during menopause, a drastic increase in loss of bone density occurs due to decline in oestrogen levels. Cartilage becomes more liable to get thin

because of the deterioration resulting in presenting complaints of symptoms of osteoarthritis. Both joints and ligaments are more likely to become inflexible, making them less rigid. The amount of muscle tissue and muscle strength decreases as age increases causing difficulty in contracting quickly. By the age of 70- 75, the total body fat typically doubles when compared to adulthood. This increases the risk of further more complications among elderly. Any difficulty in the faculty of sight is a very common indisputable sign of aging. As people get aged, their lens stiffens and gets more denser, making focusing on closer objects harder and causing visual disturbances in dim light. Once the lens

turns yellow, it results in causing an alteration in perceiving colours. Any decline in the number of nerve cells causes impairment in depth perception. Ageing tends the eye to produce less amount of fluid, making them feel dry. Prevalence of 'presbycusis' among the elderly is relatively high especially after 55 years of age. As people age, the ability to taste or smell or the sensitivity declines. Gums recedes slightly which may lead to teeth loss. Decline in number of melanocytes results in less protection against ultraviolet radiation causing large, brown spots appear on the skin.

FRAILITY

A set of collective operational modalities are obtainable for identifying and analysing the possibility of being frail among elderly populations. This is generally because frailty even up the score of vulnerabilities. The term also reflects a complex nature as it provides a slippery definition. Frailty may be defined as a progressive age-related decline in physiological functioning that results in a decline in reserves of intrinsic capacity which confers extreme vulnerability to stressors and increases the risk of a range of adverse health outcomes. Physical frailty and psychological frailty are the various types of frailty employed among geriatric population.

The concept of frailty was first discussed among 1950s and 1960s geriatric medical literature articles. However, the concept was first clearly proposed by Fried and colleagues in 2001. The most commonly used approaches include phenotypic as well as a deficit accumulation approach. The first one categorizes frailty as a biological syndrome while the later one views as a multi extended risk state. Various demographic associations with frailty includes older age, social history of the participant, marital status, psychological wellbeing, ethnicity, chronic disease conditions if any especially CHF, Type II

DM, hypertension, peripheral artery disease¹.

GRONINGEN FRAILITY INDICATOR (GFI)

Groningen Frailty Indicator or GFI is an accurate, reliable and validated screening tool to estimate frailty among participants which consist of 15 dichotomous questionnaire related to cognition, nutrition, hearing, vision, mobility, physical fitness and psychosocial functioning of the individual. Participants with a score of 4 or more can be categorized into 'frail' population. Participants with a score of 3 are indicated for individuals with finite self-care, confined to chair/bed and about less than 50% waking hours. Participants with a score of 2 are considered to be ambulant and are efficient to provide self-care however unable to do any work and about >50% of waking hours. Participants with a score of 1 are indicated for the individuals who are restricted in doing physically strenuous activity but ambulatory and able to do light work. Participants with a score of 0 are considered to be the ones who are able to carry out normal activity without any restriction².

METHODOLOGY

Study Design

A prospective cross-sectional study to assess the frailty among geriatric population using Groningen Frailty Indicator (GFI)

Study Site: The study was conducted in aged care homes, Kasaragod

Study Duration

The study was conducted for a duration of six months from September 2018 to February 2019

Sample Size

The study was limited for a sample of 100 based on the time schedule allotted for the project including other circumstances

Ethical Clearance

The protocol for the study was approved by the Institutional Ethics Committee (IEC) of Srinivas Institute of Medical Science, Mukka, Mangaluru(Ref no:EC/0009/18-19)

Study Criteria

Inclusion Criteria: Patients selected were of both gender above 60 years of age with atleast one chronic illness and taking more than one 5 or more medications

Exclusion Criteria: Patients who are less than 60 years of age and not willing to participate and without diagnosed medical condition or prescription as well

Source Of Data

Data(s) for the study were collected using data collection form from the medical records of Aged care homes, Kasaragod and through direct interaction with the patient, nurses and other staffs

Study Method

Preparation of Inform Consent Form (ICF)

Inform Consent Form were prepared in Malayalam and English and same were used. Before selection of subjects, the consent form was orally explained to the participants before filling it and non-verbally by taking help of the caregiver and staffs who are well known of the subjects in

aged care homes and made them understood. In the study, only the participants willed to fill ICF were included

Data(s) collection

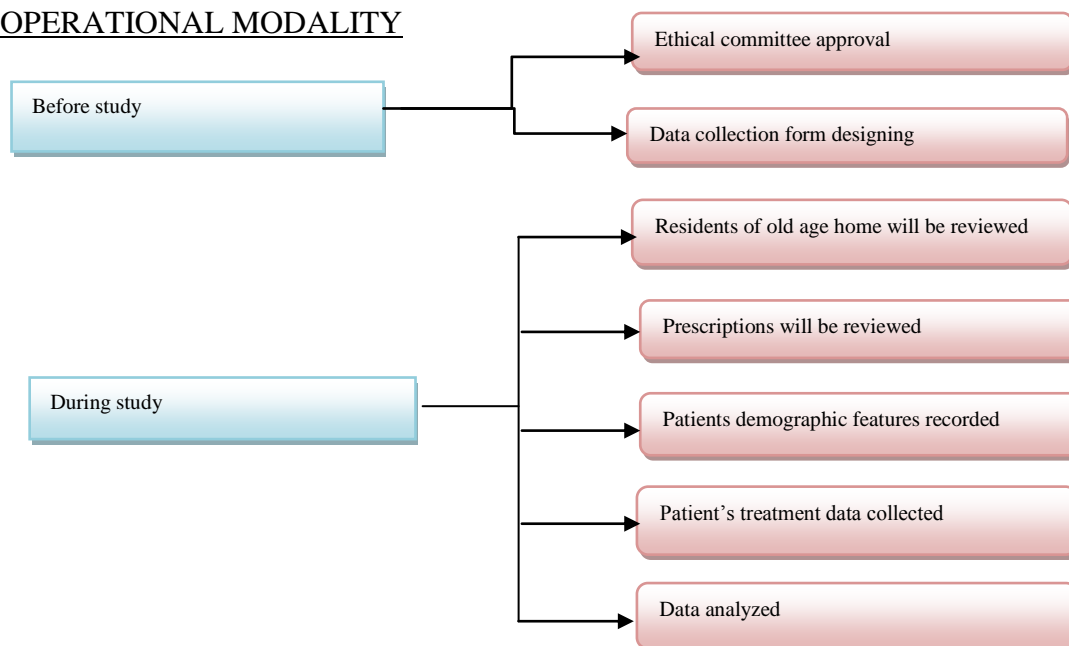
Data(s) were collected using Data collection form with the aid of medical records and through direct interaction with the patient, nurse and other staffs from aged care homes, Kasaragod Data collected includes patient name, gender, age, diagnosis, biochemical investigations and the drug prescribed

The collected data(s) were analysed for estimating frailty among the geriatric population in aged care homes, Kasaragod using Groningen frailty indicator. The obtained results after the application of the suitable tools were analysed in Microsoft Excel and all the data(s) were kept confidential

Data Analysis

Statistical analysis involves collecting and scrutinizing of every data sample in a set of items from which samples were obtained and suitable statistical test was applied to analyse the data. The collected data(s) were analysed using Microsoft excel.

OPERATIONAL MODALITY

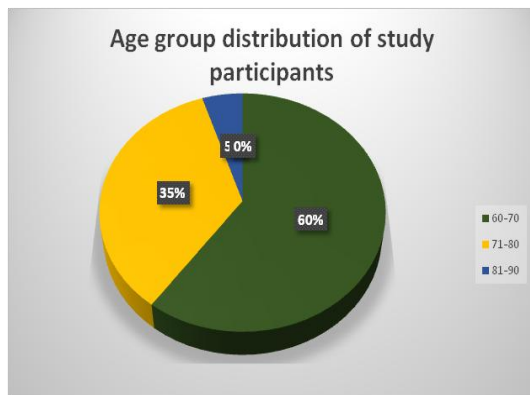


RESULTS

Socio-demographic characteristics of participants

A total of 100 participants from 3 aged care homes were included in the study. Out of these 100 participants, 54(54%) were male and 46(46%) were female. 60 participants belongs to the age group 60-70, 35 participants belongs to 71-80 age group and 5 participants belongs to 81-90 age group. Mean age of the participants was 69.27± 6.9 years (60-88 years). Around 44(44%) participants were receiving <5 medications and 56 (56%) participants were on 5 or more medications. Mean number of medications used by participants was 4.81±1.77 (range 1-10).

Population characteristics	Number
Total patients	100
Male	54
Female	46
Age range, years	60-88
AGE GROUP	
60-70	60
71-80	35
81-90	05

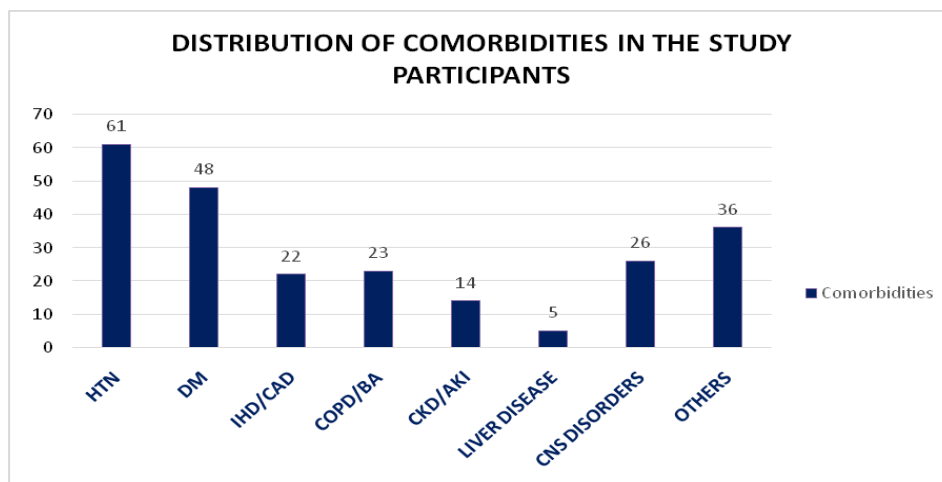


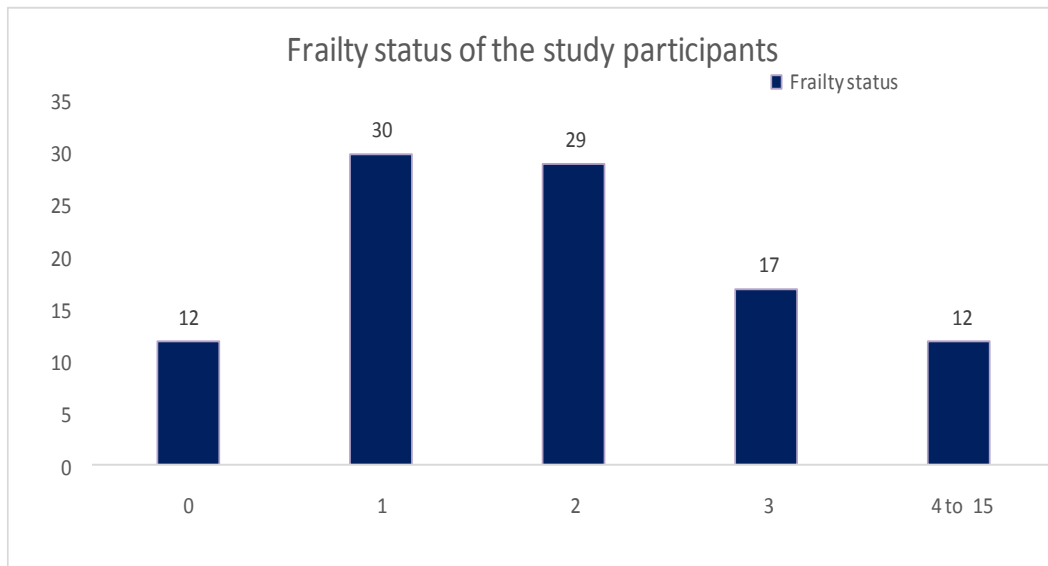
DISTRIBUTION OF COMORBIDITIES IN STUDY PARTICIPANTS

The various comorbidities present among participants includes hypertension (HTN), diabetes mellitus (DM), ischemic heart disease (IHD), chronic kidney disease, liver disease, central nervous system disease, chronic obstructive pulmonary disease and bronchial asthma. Most prevalent comorbidity observed in the participants were HTN (61%) and DM (48%).

COMORBIDITIES	TOTAL NUMBER
HTN	61
DM	48
IHD/CAD	22
COPD/BA	23
CKD/AKI	14
LIVER DISEASES	5
CNS DISORDERS	26
OTHERS	36

FRAILITY: Frailty score among geriatric population in this study was estimated using Groningen Frailty indicator. A total of 100 participants were analysed during the study. 30 (30%) participants were restricted in doing physically strenuous activity but to carry out light work, 29 (29%) participants were capable for self-care but unable to carry out any work, 17 participants were capable of only limited self-care, confined to bed or chair, 12 participants were completely disabled (GFI Score ≥ 4), cannot carry on any self-care, totally confined to bed.



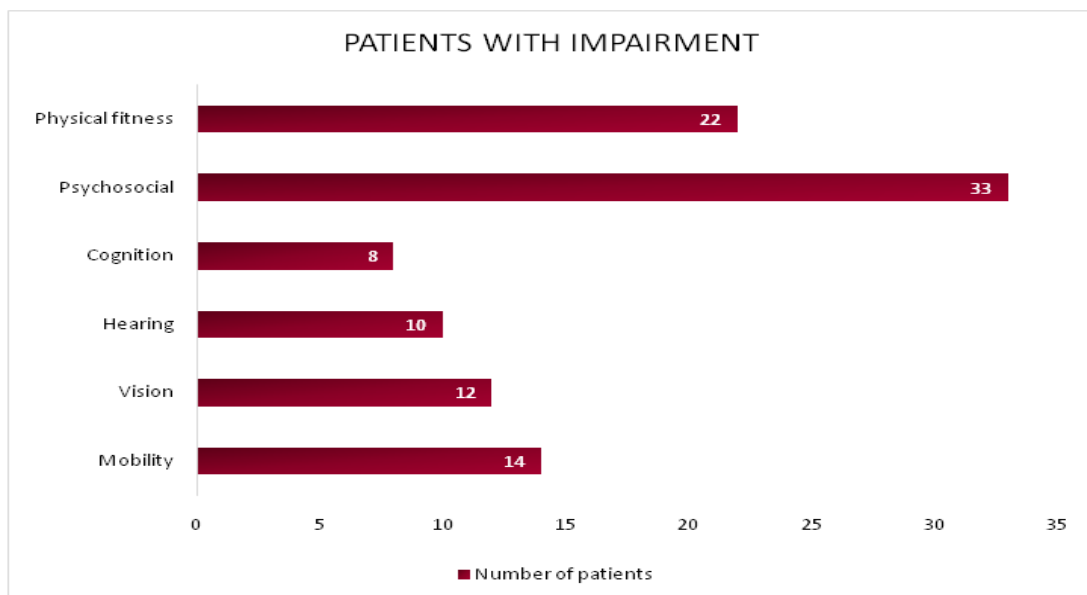


- 0- Normal activity without restriction
- 1- Restricted in physically strenuous activity but ambulatory and able to carry out light work
- 2- Ambulatory and capable for self-care , unable to carry out any work and about >50% of waking hours
- 3- Capable only limited self-care ,confined to bed or chair and about <50 % of waking hours
- 4- Completely disabled , cannot carry on any self-care , totally confined to bed

GFI

Out of the 100 patients evaluated 33 patient were found to have psychosocial impairment, 14 patients had mobility impairment, and 12 patient had vision impairment. Among the 100 patients 22 were found to be physically unfit.

GFI PARAETERS	TOTAL NUMBER OF PATIENTS WITH IMPAIREMENT
Mobility	14
Vision	12
Hearing	10
Cognition	8
Psychosocial	33
Physical fitness	22



DISCUSSION

Although exact definitions and screening tools differ, the pervasiveness of frailty in the group of geriatric population is higher. Frailty is not a disease. It is an admonition to prevent precarious health issues as well as a kick off step towards the initiation of a specific care process.

A study conducted in Netherlands by Annemiek Bielderma et al., suggests around 90% of the adults who are frail experienced problems related to psychosocial factors. The study also concludes that a multidimensional evaluation of frailty can be made with GFI³. In order to determine whether the Groningen frailty Indicator is reliable for evaluating frailty among geriatric population, Joris P et al., conducted a cross-sectional community study on measurement properties of the GFI among 353 geriatric participants where 84%(296 participants) completed all items with an internal consistency of 0.68. Through the survey conducted, the study claims that GFI is feasible, reliable and valid for evaluating or estimating frailty among geriatric population⁴. This statement is further supported by AbdelbariBaitar et al., through his study conducted on geriatric population with various types and stages of cancer⁵.

In order to assess the difference between frail as well as non-frail elderly individual and to examine their specific characteristics LL Peters et al., conducted a study of home-dwelling elderly persons and brought the conclusion that frail elderly participants when compared with the non-frail individuals experienced an increased amount of statistically significant chronic stress and many psychosocial problems. The study also supports the construct validity of the tool and provide a comprehension in the characteristics presented in (non) frail elderly participants⁶. Wei Xiang et al., with the aim of adapting and validating the GFI tool, conducted a study among the residents of Chinese nursing home(n=192) where reliability was analysed based on internal consistency and numerous test-retest methods. The study claims that the

correlations between the GFI provinces and their correlated measures demonstrates proper validity as hypothesized supporting GFI adaptable to the Chinese nursing home residents⁷.

In order to determine the best screening tool to estimate frailty among the geriatric population, Silke F Metzethin et al., conducted a study among 687 community-dwelling older participants aged greater than 70 years of age brought the conclusion that both TFI and GFI showed good internal consistency and construct validity when compared to SPQ. The findings also suggest a debatable topic regarding the better efficient screening tool among GFI and TFI. Therefore GFI and TFI can be preferred over SPQ for screening of frailty among community-dwelling older participants⁸. A similar study was conducted by Rania Khamis et al., to evaluate the psychometric properties of GFI among Lebanese elderly people using Arabic version of the same. A total of 390 participants above 65 years of age attended the questionnaire and 81.3% were considered as frail. The study aims to evaluate the reliability, feasibility and construct validity of the Arabic version of groningen frailty indicator in urban and rural populations in South Lebanon and supports the Arabic version of the screening tool following the above mentioned parameters for estimating frailty among geriatric population⁹. Adding to this, a similar conclusion was drawn from a study conducted by Rachel Ambagtsheer et al., among community-dwelling older people within the Australian clinical setting aiming to determine the accuracy of the screening tools to estimate frailty and to determine its feasibility as well as reliability¹⁰. Since prior or early detection of frailty adds an advantage to the therapeutic care provided, Irene Drubbel et al., conducted a study to ascertain whether frailty index and Groningen frailty indicator covers different or similar perspective draws the conclusion that in order to provide optimal care both FI and GFI should be employed among the

participants to estimate the frailty score thereby identifying efficient therapeutic interventions¹¹.

A cross-sectional study conducted by Syed Shahzad Hasan et al., among residents of old age-homes in Malaysia estimated 76% of the participants (more than three quarters) as frail. The number of individualized medication correlated positively ($r=0.21, P=0.002$) with GFI score. In summary, the study identifies a high prevalence of frailty among Malaysian old age-homes participants with chronic diseases². In order to determine frailty scales exhibit shared characteristics, Olga Theou et al., conducted a study on community dwelling adults from a setting of eleven European countries with a conclusion that frailty score increased non sequential manner with the age and risk to mortality increases with the frailty scores. Adding to this, women possess higher frailty scores when compared to men but demonstrated better survival. Thus proving these traits are common in nature but differs in magnitude¹².

CONCLUSIONS

Frailty being highly prevalent among the elderly population, estimation of the same with appropriate screening tool such as Groningen Frailty indicator (GFI) is highly recommended in routine clinical practices to estimate the frailty score among geriatric population thereby providing a better individualized therapeutic care plan as well as in minimizing the risk factors by employing appropriate interventions based on accurate, validated and reliable results.

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