

## Frailty Index among Older Adults with Cancer at B.P. Koirala Memorial Cancer Hospital, Chitwan, Nepal

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### Abstract

**Introduction:** The number of older adults is increasing day by day. This fact implies important health challenges. Frailty level in older adults having cancer is a globally important health issue. The concept of frailty has become gradually more accepted as one of the most important factors particularly in patients with cancer who are receiving treatment. The objective of the study was to find out the frailty index among older adults with cancer admitted for surgery at BPKMCH, Bharatpur, Nepal. **Methods:** An analytical cross-sectional study was conducted among 111 older adults. Nonprobability purposive sampling technique was used for data collection. Data were collected by face-to-face interview method using Carolina Frailty Index (CFI) developed from a cancer-specific geriatric assessment. Data was entered and analyzed by using SPSS-20, p-value <0.05 was considered as statistically significant. **Results:** The age of the respondents ranged from 60 to 87 years with mean  $\pm$  SD: 67.46 $\pm$ 6.11. Most common site of cancer was gastrointestinal system (47.7%) and the most prevalent co-morbidities in this study were diabetes mellitus (19.8%) and high blood pressure (18.0%). Based on the CFI score, 82.0% were robust, 11.7% were pre-frail and 6.3% were frail. Increasing age ( $P=0.033$ ) and ethnicity ( $P=0.042$ ) were associated with frailty. **Conclusion:** CFI is a practical way to define oncologic frailty. Though it is only a descriptive study, frailty index revealed by this study would provide valuable baseline information for further researchers.

**Keywords:** Frailty Index, Older Adult, Cancer

### Introduction

Older adults are the people who completed the age of 60 years.<sup>1</sup> Worldwide, the number of older adults is increasing day by day.<sup>2</sup> In 2050, 80% of older people will be living low- and middle-income countries.<sup>3</sup> Recently, ageing is an emerging social issue for Nepal.

Life expectancy is continuing to increase. There are 2.2 million people in age 60 and above.<sup>4</sup> About 60% of cancers occur in people 65 years of age.<sup>2</sup> Among 6063 diagnosed cancer cases, 2281 (37.8%) were the above 60 years.<sup>5</sup>

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The concept of frailty has become gradually more important factor in cancer patients who are receiving treatment with surgery. The multisystem and multidimensional effects of both cancer and surgery highlight the importance of incorporating more comprehensive preoperative assessments.<sup>6</sup> As the individual aged, changes results diminished responsiveness and ability to tolerate cancer treatment.<sup>7</sup> Though older adults should be assessed for frailty level to determine the treatment option and surgery is the most effective treatment for early stage of cancers, only 48% consider preoperative frailty assessment is mandatory and 6.4% surgeons use comprehensive geriatric assessment in their daily practice.<sup>8,9,10</sup>

In Nepal, frailty was 46.2% and significantly associated with older age ( $P < 0.001$ ).<sup>11</sup> In hospitalized older patients in India, 32% were frail and it was associated with comorbidities, decreased physical and cognitive function, and poor perceptions of health.<sup>12</sup> As median reported prevalence of frailty and Pre-frailty was 42% and 43% respectively, it also recommends routine assessment of frailty.<sup>13</sup>

Among older cancer patients, 58% were categorized as robust, 24% as pre-frail, and 18% as frail. Increasing age ( $P \leq .001$ ), lower education ( $P \leq .001$ ), and cancer type ( $P = .002$ ) were associated with increasing levels of frailty.<sup>14</sup> Frailty predict adverse health outcomes to death.<sup>15</sup> Frailty assessment can help in choosing the better option for treatment.<sup>16</sup> Comprehensive geriatric assessment and frailty index determination before starting any treatment modality for cancer is mandatory to prevent different complications.<sup>17</sup> There have been few published studies about frailty in

developing world.<sup>12</sup> Yet there is limited knowledge and understanding about frailty.<sup>18</sup> So, this study aims to assess the frailty among older adult with cancer admitted for surgery.

### Methodology

A descriptive cross-sectional study was conducted among the older adults admitted for surgery at B.P. Koirala Memorial Cancer Hospital, Chitwan, Nepal. Ethical clearance was obtained from BPKMCH-IRC Bharatpur, Chitwan. Informed written consent was taken from all respondents before data collection. Data was collected by using structured interview schedule through face-to-face interview method and sample was selected by using nonprobability purposive sampling technique. The instrument consisted of 2 parts. Part I consists of socio-demographic and health related information. Part II consisted of a structured standard tool "Carolina Frailty Index". It has 8 domains and 36 variables that contain continuous variables with range 0–1 (0 = absence of deficit and 1 = presence of deficit). Respondent's dignity was maintained by giving them the right to reject or discontinue from the research study at any time if they do not want to participate in the study. Confidentiality was maintained by not disclosing the information to others. All collected data was reviewed and checked daily for its completeness, consistency and accuracy. Data were edited, organized, coded and entered in IBM SPSS Statistics 17 for analysis. Data was analyzed using descriptive and inferential statistics. In the descriptive statistics for categorical variables, frequency and percentage were calculated. While for continuous variables, mean and standard deviation was calculated. In the inferential

statistics to find the association between categorical variable chi-square test was used. P-value <0.05 was considered statistically significant.

## Results

(Table 1) Among 111 participants, the age of the respondents ranged from 60 to 87 years with mean  $\pm$  SD: 67.46 $\pm$ 6.11. Most common age 65-70 years (35.1%), male (55.0%), underweight or BMI<18.5 (11.7%), Janajati (40.5 %), Hindu (70.0%) and illiterate were (55.0%). Most of the respondents' occupation was agriculture (65.8%).

(Table 2) showed that, most common site of origin of cancer was gastrointestinal system (47.7%).

(Table 3 and 4) shows the CFI score on different domains and variables. Most prevalent co- morbidities in this study were diabetes mellitus (19.8%) and high blood pressure (18.0%).

(Table 5) showed the CFI score. Based on the CFI score with mean (SD) = .1300 (.11168), majority (82.0%) were robust, 11.7% were pre-frail and 6.3% were frail.

(Table 6) showed the association between CFI scores with different selected variables. Increasing age ( $P=0.033$ ) and ethnicity ( $P=0.042$ ) were associated with frailty.

(Table 7) shows the association between frailty index score with site of cancer. This shows that there is no association between frailty index score with site of cancer (p-value>0.05).

Table 1: Socio-demographic characteristics (n=111)

Variables	Frequency	Percentage
<b>Age in years</b>		
60-65	36	32.4
65-70	39	35.1
70-75	20	18.0
75-80	13	11.7
$\geq$ 80	3	2.7
Min: 60, Max: 87, Mean $\pm$ SD: 67.46 $\pm$ 6.11		
<b>Gender</b>		
Male	61	55.0
Female	50	45.0
<b>BMI</b>		
Under weight (<18.5)	13	11.7
Healthy weight (18.5-<25)	77	69.4
Overweight (25-<30)	16	14.4
Obesity ( $\geq$ 30)	5	4.5
<b>Ethnicity</b>		
Brahman/Chhetri	44	39.6
Madhesi	11	9.9
Dalit	7	6.3
Janajati	45	40.5
Muslim	3	2.7
Other	1	0.9
<b>Religion</b>		
Hindu	78	70.3
Buddhist	29	26.1
Christian	1	0.9
Other	3	2.7
<b>Education</b>		
Literate	50	45.0
Illiterate	61	55.0
<b>Occupation</b>		
Agriculture	73	65.8
Business	15	13.5
Daily wages	13	11.7
Service/Retired	10	9.0

Table 2: Site of Cancer (n=111)

Variables	Frequency	Percentage
<b>Site of cancer</b>		
Lung/Bronchus	10	9.0
Breast	11	9.9
Gastrointestinal	53	47.7
Genitourinary	18	16.2
Head and neck	7	6.3
Gynaecology	4	3.6
Orthopedics	8	7.2

Table 3: Carolina Frailty Index (Instrumental Activities of Daily Living and Function, Overall, Health and Physical Function) (n=111)

Domains	Response	Number (%)
<b>Instrumental activities of daily living and function (IADLS)</b>		
Using telephone	Without help	105(94.6)
Get to places out of walking distance	Without help	103(92.8)
Shopping for groceries or clothes	Without help	100(90.1)
Prepare own meals	Without help	99(89.2)
Do housework	Without help	100(90.1)
Take own medicines	Without help	103(92.8)
Handle own money	Without help	102(91.9)
Lift or carry groceries	Not limited at all	97(87.4)
Climb one flight of stairs	Not limited at all	95(85.6)
Bend, kneel or stoop	Not limited at all	99(89.2)
Walk one block	Not limited at all	102(91.9)
Bath or dress	Not limited at all	108(97.3)
<b>Overall Health</b>		
Self-reported health	Some symptoms of disease	48(43.2)
<b>Physical function</b>		
Falls in the last 6 months	No	108(97.3)
Timed up and go test	<14 seconds	86(77.5)

Table 5: Carolina Frailty Index Score (n=111)

Items	Outcome Measures
Robust (0-0.2)	91 (82.0%)
Pre frail (0.2-0.35)	13 (11.7%)
Frail (>0.35)	7 (6.3%)
Mean (SD)	.1300 (.11168)
Range	.03-.57

Table 4: Carolina Frailty Index (Co-morbidity, Vision, Hearing, Nutrition, Mental Health, Social Activity, Medications and Cognition) (n=111)

Domains	Response	Number (%)
<b>Co morbidity</b>		
Other cancer or leukemia	No	111(100)
Arthritis or rheumatism	No	110(99.1)
Glaucoma	No	110(99.1)
Emphysema or chronic bronchitis	No	104(93.7)
High blood pressure	No	91(82.0)
Heart disease	No	108(97.3)
Circulation trouble in arms or legs	No	110(99.1)
Diabetes	No	89(80.2)
Stomach or intestinal disorders	No	101(91.0)
Osteoporosis	No	110(99.1)
Chronic liver or kidney disease	No	109(98.2)
Stroke	No	109(98.2)
Depression (recently taking medicines)	No	111(100)
<b>Vision, Hearing, Nutrition, Mental health, social activity, Medications and Cognition</b>		
Eyesight	Excellent	86(61.3)
Hearing	Excellent	78(70.3)
Unintentional weight loss	No	28(25.2)
	A little	
Felt down hearted or blue	of the	70(63.1)
	time	
	A good	
Felt calm or peaceful	bit of	40(36.0)
	time	
Physical or emotions	A little	
problems interfered with	of the	61(55.0)
social activities	time	
Number of daily medicines	0-8	108(97.3)
Blessed orientation memory concentration test	<11	89(80.2)

Table 6: Association between Frailty Index Score with Selected Variables (n=111)

Variables	Robust	Pre-frail	Frail	Chi-square	P-value
<b>Age</b>					
60-70	67(83.8)	10(12.5)	3(3.8)	10.456	0.033
70-80	23(82.1)	1(3.6)	4(14.3)		
>80	1(33.3)	2(66.7)	0(0)		
<b>Gender</b>					
Male	49(80.3)	8(13.1)	4(6.6)	0.289	0.865
Female	42(84.0)	5(10.0)	3(6.0)		
<b>BMI</b>					
Under weight (<18.5)	8(61.5)	3(23.1)	2(15.4)	6.396	0.172
Normal weight (18.5-<25)	65(84.4)	7(9.1)	5(6.5)		
Overweight (25-<30)	13(81.3)	3(18.8)	0(0)		
Obesity (≥30)	5(100.0)	0(0.0)	0(0.0)		
<b>Ethnicity</b>					
Brahmin/Chhetri	37(84.1)	7(15.9)	0(0)	18.873	0.042
Madhesi	7(63.6)	2(18.2)	2(18.2)		
Dalit	7(100.0)	0(0.0)	0(0.0)		
Janajati	37(82.2)	4(8.9)	4(8.9)		
Muslim	3(100.0)	0(0.0)	0(0.0)		
Other	0(0.0)	0(0.0)	1(10.0)		
<b>Religion</b>					
Hindu	65(83.3)	10(12.8)	3(3.8)	9.068	0.17
Buddhist	23(79.3)	2(6.9)	4(13.8)		
Christian	0(0.0)	1(10.0)	0(0.0)		
Other	3(100.0)	0(0.0)	0(0.0)		
<b>Education</b>					
Literate	43(86.0)	5(10.0)	2(2.0)	1.21	0.546

Illiterate	48(78.7)	8(13.1)	5(8.2)	6.769	0.343		
<b>Occupation</b>							
Agriculture	58(79.5)	10(13.7)	5(6.8)				
Business	13(86.7)	1(6.7)	1(6.7)				
Daily wages	13(100.0)	0(0.0)	0(0.0)				
Service/Retired	7(70.0)	2(20.0)	1(10.0)				

Table 7: Association between Frailty Index Score with Site of Cancer (n=111)

Site of Cancer	Robust	Pre-frail	Frail	Chi-square	P-value
Lung/Bronchus	8(80.0)	1(10.0)	1(10.0)	8.905	0.711
Breast	10(90.9)	1(9.1)	0(0.0)		
Gastrointestinal	44(83.0)	5(9.4)	4(7.5)		
Genitourinary	16(88.9)	1(5.6)	1(5.6)		
Head and neck	5(71.4)	1(14.3)	1(14.3)		
Gynecology	3(75.0)	1(25.0)	0(0.0)		
Orthopedics	5(62.5)	3(37.5)	0(0.0)		

## Discussion

The concept of frailty and the use of the frailty index has been gradually gaining acceptance for the treatment planning of older adults. It is the first step in assessing the frailty level using Carolina Frailty Index in older adults with cancer admitted for surgery at BPKMCH, Nepal.

This study revealed that, age of the respondents ranged from 60 to 87 years with mean  $\pm$  SD: 67.46 $\pm$ 6.11. Nearly similar findings were found in the another study in which among 190 patients, mean age was 70 years (range 65–86) .<sup>19</sup> While another

study found that the mean age was 72 years.<sup>20</sup> In this study, most common site of cancer was gastrointestinal system (47.7%) while in another study, among the respondents, the most prevalent form of cancer was colorectal (69.3%).<sup>21</sup>

Most prevalent co- morbidities in this study were diabetes mellitus (19.8%) and high blood pressure (18.0%) while another study showed similar finding on diabetes mellitus (19.0%) and contrast on high blood pressure (50.0%).<sup>14</sup>

This study found that, mean (SD) of the CFI was .1300 (.11168) and based on the CFI, 82.0% were robust, 11.7% were pre-frail and 6.3% were frail. Nearly similar finding was found on other study that, 49 (78%) patients were robust, 11 (18%) pre-frail, and 3 (5%) frail.<sup>19</sup> Contrast finding was found on another study which showed that, 58 % were categorized as robust, 24% as pre-frail, and 18% as frail.<sup>14</sup> Similarly other study also found that mean of CFI for the study population was 0.22, with 54% classified as robust, 22% as pre-frail, and 24% as frail.<sup>21</sup>

This study showed that increasing age ( $P=0.033$ ) and ethnicity ( $P=0.042$ ) were associated with frailty while increasing age ( $P\leq 0.001$ ), lower education ( $P\leq 0.001$ ), and cancer type ( $P=0.002$ ) were associated with increasing levels of frailty in another study.<sup>14</sup>

## Conclusion

It is only the descriptive study, finding of this study will provide valuable baseline information for further researcher. The majority of the older adults admitted for surgery were robust. Increasing age and

ethnicity were associated with frailty. So, frailty assessment is more importantly recommended among older adults.

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