

**A STUDY ON THE ASSESSMENT OF FRAILITY AND INFLUENCING FACTORS IN
THE ELDERLY**Yueh-Chin Chung, Ph. D^{1*}¹Department of Nursing, Central Taiwan University of Science and Technology, Taichung, Taiwan.***Corresponding Author: Dr. Yueh-Chin Chung, Ph. D**

Department of Nursing, Central Taiwan University of Science and Technology, Taichung, Taiwan.

Article Received on 24/08/2023

Article Revised on 14/09/2023

Article Accepted on 04/10/2023

ABSTRACT

Background: The age structure of the elderly population is rapidly aging in Taiwan. It is estimated that Taiwan will enter a super-aged society in 2025 and increase to 27.4% in 2070. Long-term care ten-year plan 2.0 for the care of frail groups, increase the service items of preventing disability or delaying disability, providing muscle strengthening exercises and reablement care for the elderly training. **Purpose:** The purpose of this study was to explore the basic attributes of the research object and the current situation of the degree of frailty; the correlation between the basic attributes of the research object and the degree of frailty and the factors that affect the degree of frailty. **Method:** Purposive sampling method, the total sample size was 30 in a day care center in central area, Using the questionnaire and interview method of "Chinese version of the Kihon Checklist (KCL)" as a research tool. The SPSS 22.0 software was used for t-test, one-way ANOVA and correlation analysis. **Results:** The research subjects were 19 females (63.3%), aged between 63-94 years old, with an average age of 81.10 years old, with an education level of less than 11 (36.7%) in elementary school; 29 (96.7%) are married, and 29 are living with family members (3-5) (96.7%); exercise 26 (86.7%); smoke 3 (10.0%); drink 1 (3.3%); have hearing problems at 9 (30.0%), sleep well at most 15 ;13 (14.9%) had hypertension, diabetes by 11 (12.6%); 6 (46.1%) had low back pain. In the analysis of frail risk groups, 17 people (56.7%) with a total score of more than 10 points (inclusive) (high risk group for frailty), 11 people (64.7%) are women, and 5 people (39.5%) are 75-84 years old. Among the potential risk groups, 17 (56.7%) were the top two with motor function risk of 3 or more, and 13 (43.3%) had oral function risk of 2 or more. The top two groups of frailty risk groups were 25 (83.3%) with cognitive function risk 1 point, 13 (43.3%) with oral function risk 2 point and 13 (43.3%) with social function risk 2 point. The risk of independent living was positively correlated with total frailty screening; the risk of motor function was positively correlated with total frailty screening; the risk of oral function was negatively correlated with chronic diseases; the risk of social functioning was positively correlated with total frailty screening; Frailty screening was positively correlated overall and negatively correlated with age. Personal attributes of "education level", "exercise status" and "smoking status" items have significant differences in the risk of frailty, and different education levels have significant differences in the risk of social function ($t = 2.29, p < .05$), elementary school score higher than illiterate; there was a significant difference in risk of nutritional status with or without exercise status ($t = 2.81, p < .05$), with exercise scored higher than without exercise; with or without smoking status was significantly different in risk of nutritional status ($t = .03, p < .05$), the score of non-smoking was higher than that of smoking. **Conclusion:** A reliable and valid screening tool to assess frailty in the elderly, can identify high-risk groups, and can understand the degree of frailty and influencing factors, it is recommended to provide muscle strengthening exercise, oral health care, dietary nutrition, cognitive promotion and social participation to prevent disability or defer reference to disabled services. Frailty assessment is meaningful for the health risk assessment level of the elderly population, and should be extended to elderly care centers or long-term care institutions, so as to develop relevant preventive plans and strategies.

KEYWORDS: The elderly, frailty, Kihon Checklist (KCL) questionnaire, day care.**INTRODUCTION**

In 2019, the United Nations "World Population Prospects" (World Population Prospects, 2019) revealed that the global population will increase by 2 billion in the next 30 years, and it is expected to reach an incredible 9.7 billion by 2050, approaching the threshold of 10 billion. to 11 billion. Due to longer life expectancy and

lower global birth rates, the number of countries with declining populations will increase substantially, and the global population will age more severely. By 2050, one out of every six people in the global population will be over 65 years old, accounting for 16% of the total population. Currently, one out of every 11 people is over 65 years old, accounting for 9% of the total population.

In addition, by 2050, the population over the age of 80 will increase from the current 143 million to 426 million. Population aging has become a problem that the world must face together.^[1] Taiwan has become an aging society in 1993, and it will become an aging society in 2018. It is estimated that it will enter a super-aging society in 2025. The age structure of the elderly population is rapidly aging. In 2021, the super-aged (over 85 years old) population will account for 10.5% of the elderly population, and it will increase to 27.4% in 2070.^[2]

In response to the resulting long-term care needs, the Ten-Year Long-Term Care Plan 2.0 expands service targets and projects, with the main purpose of preventing the elderly from becoming caregivers and improving the quality of life of caregivers. In order to prevent and delay the disability or dementia caused by the aging process, the Ministry of Health and Welfare launched the "Prevention and Delay of Disability Care Plan" in 2017, mainly serving the frail elderly and mildly or moderately disabled persons objects, through medical and related professional groups, plan six major preventive care themes, including muscle strengthening exercises, life function reconstruction training, social participation, oral health care, dietary nutrition and cognitive promotion, etc., provide single or compound care programs, and combine community local resources and, and through the lively, interesting and purposeful leadership of instructors, prevent frail elderly from industry-government-university cooperation jointly promote, introduce appropriate intervention programs becoming disabled or demented, and delay the rapid deterioration of disabled or demented elderly, increasing It is healthy for the rest of their lives, and allows the elderly to live with dignity and happiness. This characteristic research project selects 30 elders from Day Care Center for research on frailty assessment, life function reconstruction training and muscle strength strengthening exercise, including three sub-projects, project 1. Research on the frailty assessment and its influencing factors of the elderly ; Project 2. The effect of life rehabilitation training based on the use of assistive devices in the day care center; Project 3. The impact of the circular fun game program on the cognition, muscle strength, body composition, body function performance and quality of life of the elderly.

Frailty of definition

The care for the frail group is mainly to increase services for preventing or delaying disability, providing muscle strengthening exercises, life functional reconstruction training, dietary nutrition, oral health care, cognitive promotion and other services.^[3,4] Frailty can be said to be a precursor to functional degeneration in the elderly group, and it is also the beginning of a vicious cycle of many geriatric syndromes. As the age increases, the physiological system gradually degenerates, and the ability of various organ systems in the body to resist stress and maintain stability also decreases. These

phenomena These include: tiredness, decreased appetite, weight loss, muscle loss, abnormal gait balance, bone loss, etc. The sequelae caused by frailty syndrome include: decreased physical and mental function and activity, repeated hospital admissions, which can lead to bone loss and increase the risk of falls.^[5] Fried et al. (2001)^[6] believed that frailty refers to the progressive decline of physiological function in multiple systems of the body, which has the risk of loss of function, increased disease, death, fall, disability and other adverse health outcomes. Frailty refers to the following conditions: Three or more operational definitions of frailty included indicators of unintentional weight loss, self-reported exhaustion, weakness, slow walking speed, and low physical activity. Frailty is the precursor of the elderly's disability tendency and functional degradation, and it is also an intermediate stage between independent life and death. The frailty of the elderly is an important public health problem that urgently needs to be addressed. If there is a reliable and valid tool for screening and evaluating the frailty of the elderly, which can identify high-risk groups and provide appropriate preventive measures and services early, it will be even more distributed Therefore, frailty assessment is one of the most important and urgent tasks in the prevention and treatment of frailty in the elderly.

Prevalence of debilitating

The prevalence of frailty among the elderly in foreign communities accounts for about 10%, and prefrail accounts for about one-third to half; tendency about 28 to 44%. The prevalence of frailty increases with age, ranging from 20 to 30% for those over 75 years of age, and as high as 30% for those over 90 years of age.^[7,8] Frailty and early frailty increase the risk of negative health outcomes. A meta-analysis found that the risk of death was 1.8 to 2.3 times, and the fourth-level object was "late frailty": obvious frailty, poor resistance to injury, and decreased vitality, leading to disability. The five-level object is "end-stage frailty": severe frailty, low cholesterol, weight loss, poor vitality, dependence, and high mortality within one year^[9]; the risk of loss of activities of daily living (ADL) is 1.6 to 2.0 times the risk of hospitalization; 1.2 to 1.8 times the risk of hospitalization; 1.5 to 2.6 times the risk of physical limitation; and 1.2 to 2.8 times the risk of falls and fractures⁷. Due to population ageing, frailty has become a fundamental concept as it identifies older persons at higher risk of adverse outcomes such as disability, institutionalization, reduced quality of life and premature death.^[10] More than half of residents in long-term care facilities are frail. The older you are, the greater the chance of frailty, and the prevalence of frailty in people over the age of 85 can reach a quarter.^[11] The results of the study by Lupon et al.^[12] found that the rate of debilitation in outpatient heart failure patients was 39.9%.^[12] Lu et al. (2010)^[13] also found that the rate of frailty among the elderly with chronic diseases in outpatient clinics was 19%, both of which showed that the rate of frailty among outpatients was high; and found

that the rate of frailty among the elderly with chronic diseases in outpatient clinics was much higher than that of Fried et al. (2001).^[6] The frailty rate of the elderly is 6.9%.^[6,13] Taiwan Chen et al. (2021)^[14] conducted a survey with a custom-made screening tool and found that the prevalence of frailty and frailty tendency were 4.9% and 40.0% among the community elderly over 65 years old in Taiwan.^[14] The prevalence of inpatients, outpatients, and community frailty in Taiwan is different. The prevalence of inpatient frailty in a southern medical center was 88.7%; the prevalence of frailty in the elderly in family medicine outpatient clinics was 19%.^[9]

The Taiwan government has promoted the long-term care 2.0 plan since 2017. For the prevention and delay of disability care plans, it will invest annually from 2017 to 2018 NT\$600-700 million^[3] is for the initial and secondary prevention in the three-stage five-level prevention strategy. In order to analyze domestic frail care policies, the three-stage and five-level prevention model of disease is used as the basis, and the strong and weak crisis model (SWOT) is used for policy analysis and policy advice.^[9]

Demographic background associated with frailty

Many studies have pointed out that women are more socially frail than men. High, van Oostrom et al. considered that women had a lower risk of social frailty. Freid et al. (2001)^[6] and Mello et al. (2014)^[16] found that there were more elderly women in the frailty group.^[6,15-17] The older^[18-25]; low educational attainment^[15,19,21,25]; single, divorced or widowed^[26,27]; the research results show that the proportion of living alone is higher than that of Freid et al. (2001)^[6] and Wu et al. (2011)^[28] the frailty group showed a positive correlation with living alone^[28]; in terms of lifestyle, there was a lack of physical activity or exercise^[15,24,29], smoking^[26], drinking^[19,29], hearing problems^[29,30], excessive sleep, daytime sleepiness^[15,18], chronic disease or multiple diseases^[24,30], malnutrition^[24,30], higher levels of pain.^[31]

Results of prevention and delay disability care program

The Ministry of Health and Welfare (2017)^[3] reported the implementation results of the national prevention and delay disability care plan, with a total of 17,117 people participating planned services, the average age is 76 years old, the male to female ratio is about 1:3, and the frail elderly account for about 67%. The results found that the scores of the participants in independent living, exercise, nutrition, oral cavity, social interaction, dementia, depression and comprehensive potential nursing risks were significantly improved compared with those before participating in the activity^[32,33], the total score is 25 points, and the overall progress is 2.3 points.^[34] According to the 2017 Taiwan Elderly Status Survey Report, 17.52% of the 3 frailty assessment items have 1 to 2 pre-frail people, and they are in the for those in the frailty period (equal to 3 items), 1.46% were 65-69 years old, 4.46% were 75-79 years old, and 5.43% were over 80 years old. In Taiwan, the rate of frailty over the age of 55 increases with age, and the elderly aged 75 to 79 are the age group with obvious decline.^[32] The KCL-C scale has good judgment and is easy to answer. And convenience, it can be used as a rapid screening tool for frailty in the elderly.

MATERIALS AND METHODS

The research framework is shown in Figure 1. This study is a cross-sectional study with intentional sampling method. The subjects of this study are 30 elderly people in a day care center in central China. The researcher personally explained the purpose of the study and the sequence of procedures to the elders in the day care center, and after obtaining the consent of the elders, the Kihon Checklist (KCL) questionnaire and interview could be conducted. The inclusion criteria were as follows: able to communicate and follow instructions to complete the assessment, and the exclusion criteria were as follows: dementia, mental illness. The SPSS 22.0 software was used for t test, single factor analysis of variance and correlation analysis.

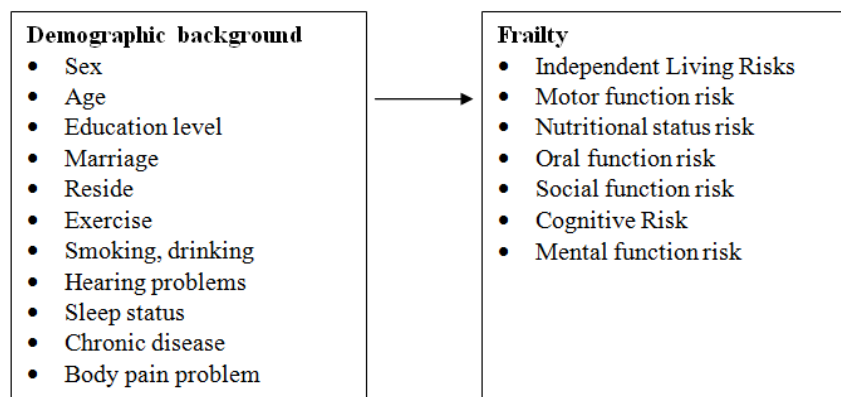


Figure 1: Research framework.

Research Ethical Considerations

Before the study was conducted, it was approved by the Review Board (IRB) of a hospital in Central Taiwan

(REC111-32). In order to respect the willingness of the subjects to participate in this study, the purpose and process of the study were explained to the subjects

before the study. And its basic rights, oral questionnaire survey after soliciting the subject's independent consent, this questionnaire is for purely academic research purposes, adopts a secret anonymous method, the information obtained is for academic reference only, the options filled in are not right or wrong, personal information will not be disclosed to the public. If there is any discomfort during the participation in this research, the subject has the right to decide to participate or refuse all research records at any time, which will be properly stored and kept confidential in a file cabinet, and the retention period is until the end of the research. After 3 years, and destroyed after the end of the retention period.

RESULTS

Distribution of demographic background information

19 of the research subjects were women (63.3%), the age group was 63-94 years old, the average age was 81.10 years old, and the education level was mostly elementary school for 11 (36.7%); the marriage was married at most 29 (96.7%) 29 people (96.7%) live with family members with 3~5; 26 people (86.7%) exercise; 3 people smoke (10.0%); 1 person (3.3%) drinks alcohol; 15 people (50.0%) had good sleep conditions, 13 people (17.3%) had high blood pressure, followed by diabetes 11 people (14.7%); 6 people had low back pain (50.3%).

Table 1: Distribution of demographic background (N=30)

Variable Name	category	number of people	percentage (%)
sex	male	11	36.7
	female	19	63.3
age	63-64	1	3.3
	65-74	5	16.7
	75-84	12	40.0
	85-89	12	40.0
education level	illiterate	8	26.5
	elementary school	11	36.6
	middle school	2	6.7
	high school	2	6.7
	junior college	1	3.3
	university or above	6	20.2
marriage	Married	29	96.7
	unmarried	1	3.3
	divorce	0	0.0
reside	live with family	29	96.7
	living alone	1	3.3
exercise	yes	26	86.7
	no	4	13.3
smoking	yes	3	10.0
	no	27	90.0
drinking	yes	1	3.3
	no	29	96.7
hearing problems	yes	9	30.0
	no	21	70.0
sleep status	very good	9	30.0
	good	15	50.0
	not good	6	20.0
	very bad	0	0.0
chronic disease (multiple choice) (Total number of diseases: 75)	no	1	3.3
	yes	29	96.7
	cancer	1	1.3
	Parkinson's disease	3	4.0
	depression	5	6.7
	hypertension	13	17.3
	heart disease	6	8.0
	stroke	4	5.3
	enlarged prostate	5	6.7
	bone and joint injury	8	10.6
	diabetes	11	14.7
	eye problems	2	2.7
	kidney disease	5	6.7

	dizzy	3	4.0
	liver problems	2	2.7
	thyroid	2	2.7
	hyperlipidemia	4	5.3
	chronic obstructive pulmonary disease	1	1.3
body pain problem (multiple choice) (Total number of diseases:14)	yes	17	56.7
	no	13	43.3
	hand	3	21.4
	legs	1	7.1
	hemodialysis wound	1	7.1
	low back pain	6	50.3
	sore throat	1	7.1
	groin injury	1	7.1

The distribution of the seven aspects of frailty

According to the analysis of the frailty screening scale, the total score of frailty screening was 325 points (10.8 ± 0.7 points), with the highest score for independent living risk, the average score was 95 points (3.2 ± 0.3), and the lowest score for nutritional status risk was 9 points (0.3 ± 0.1) (Table 2). Analysis of frailty risk groups, with a total score of 10 or more (inclusive) (frail high-risk group) 17 people (56.7%), among potential risk groups, 17 people (56.7%) had motor function risk of 3 points or more, and nutritional status risk of 2 points More than 2 people (6.7%), oral function risk of more than 2 points accounted for 13 people (43.3%), psychological function risk of more than 2 points accounted for 9 people

(30.0%) (Table 3). Analysis of frailty risk groups showed that 8 people (26.7%) had an independent living risk of 5 points, 11 people (36.7%) had a motor function risk of 3 points, 2 people (6.7%) had a nutritional status risk of 2 points, and 2 people (6.7%) had an oral function risk of 2 points. 13 people (43.3%), social function risk score 2 accounted for 13 people (43.3%), cognitive function risk score 1 accounted for 25 people (83.3%), psychological function risk score 5 accounted for 1 person (3.3%) (Table 3). Analysis of frail high-risk groups with a total score of 10 or more showed that 11 (64.7%) were females, and 5 (29.4%) were females aged 75-84 years old (Table 4).

Table 2 Analysis of the overall and each aspect of the frailty screening scale (N=30)

Variable Name	Total score	Average Score	Standard Deviation	Rank
Total of frailty screening	325	10.8	0.7	
independent Living Risks	95	3.2	0.3	1
motor function risk	63	2.1	0.2	2
nutritional status risk	9	0.3	0.1	6
oral function risk	44	1.5	0.1	3
social function risk	37	1.2	0.1	5
cognitive Risk	42	1.4	0.1	
mental function risk	35	1.2	0.2	5

Table 3 Analysis of frailty risk groups (N=30)

Variable Name	Number of People	Percentage (%)
Frail High-Risk Groups A total score of 10 points or more (inclusive)	17	56.7
Potential Risk Groups (N=30)		
Motor function risk 3 points or more	11	36.7
Nutritional status risk score 2 or more	2	6.7
Oral function risk more than 2 points	13	43.3
Psychological function risk 2 points or more	9	30.0
Frailty Risk Group (N=30)		
Independent living risk 5 points	8	26.7
Motor function risk 3 points	11	36.7
Nutritional status risk 2 points	2	6.7
Oral function risk 2 points	13	43.3
Social functioning risk 2 points	13	43.3
Cognitive risk 1 point	25	83.3
Psychological function risk 5 points	1	3.3

Table 4: Analysis table for frail high-risk groups with a total score of 10 or more (N=17).

Frail high-risk groups with a total score of 10 or more (inclusive)/Variable	Variable category	Number of People	Percentage (%)
Sex	Male	6	35.3
	Female	11	64.7
Age			
63-64	Male	1	5.9
	Female	0	0.0
65-74	Male	0	0.0
	Female	3	17.6
75-84	Male	2	11.9
	Female	5	29.4
85-89	Male	3	17.6
	Female	3	17.6

In terms of independent living risk, the highest total score of 24 is "Do you usually go out by yourself by public transportation (such as MRT, bus, streetcar)?"(M=0.80); the lowest total score of 9 is "Do you become a family member or Is it a friend's complaint or counseling object?"(M=0.30). In terms of motor function risk, the highest total score of 18 points is "Have you ever fallen in the past year?", "Are you very worried about falling?"(M=0.60); the lowest total score is 5 points "Can anything stand up from sitting in a chair?"(M=0.77). In terms of nutritional status risk, the highest total score of 6 points is "Have you lost more than 2-3kg in 6 months?"(M=0.20); the lowest total score is 3 points "Is your BMI less than 18.5?"(M=0.30). In terms of oral function risk, the highest total score of 24 points is "Compared with six months ago, are you less able to eat hard things?" (M=0.60); the lowest total score is 12 points "Do you often feel thirsty?"(M =0.40). In terms of social function risk, the highest total score of 19 points is "Has the number of outings decreased compared to last year?"(M=0.63); the lowest total score of 18 is "Does the person go out at least once a week?"(M=0.60).In terms of cognitive function risk, the highest total score of 15 points is "Do you check the phone number and make a call yourself?"(M=0.50); the lowest total score of 13 points is "Has there ever been a situation where you don't know what day it is?"(M=0.43). In terms of psychological function risk, the highest total score of 11 points is "in the past two weeks, have you felt tired or burnt out for no reason?"(M=0.37); the lowest total score is 4 points "in the past two weeks, have you Things started to feel boring and tedious?(M=0.13) (table data not show).

$p = .051$), and negatively associated with age ($r = .45$, $p = .05$) (Table 5).

Correlation of the seven aspects of frailty

Independent living risk was positively associated with frailty screening total ($r = .66$, $p = .01$); motor function risk was positively associated with frailty screening total ($r = .48$, $p = .01$), age ($r = .47$, $p = .05$) was positively correlated; oral function risk was negatively correlated with chronic disease ($r = -.39$, $p = .05$); social functioning risk was positively correlated with frailty screening total ($r = .61$, $p = .001$); Risk for cognitive function was positively associated with risk for mental function ($r = .41$, $p = .05$), total frailty screening ($r = .58$,

Table 5: Correlation analysis of the seven aspects of frailty (N=30).

Aspects	aspects										
	Independent Living Risks R value	Motor function risk R value	Nutritional status risk R value	Oral function risk R value	Social function risk R value	Cognitive Risk R value	Mental function risk R value	Total of Frailty Screening R Value	Chronic Disease R Value	Body Pain Problem R Value	Age R Value
Independent Living Risks	1	0.13	0.09	0.04	0.33	0.15	0.17	0.66**	0.09	-0.18	-0.09
Motor Function Risk	0.13	1	0.32	-0.01	0.29	-0.13	0.03	0.48**	-0.13	-0.02	0.47**
Nutritional Status Risk	0.19	0.32	1	0.12	0.14	0.09	-0.10	0.35	0.25	-0.22	0.23
Oral Function Risk	0.04	-0.01	0.12	1	0.25	-0.03	-0.04	0.29	-0.40*	-0.16	0.04
Social Function Risk	0.33	0.29	0.14	0.25	1	-0.04	0.25	0.61**	0.32	-0.18	0.17
Cognitive Risk	0.15	-0.13	0.09	-0.03	-0.04	1	0.41*	0.41*	0.11	0.06	-0.32
Mental Function Risk	0.17	0.03	-0.10	-0.04	0.25	0.41*	1	0.58**	0.19	0.28	-0.45*
Total of Frailty Screening	0.66**	0.48**	0.35	0.29	0.61**	0.41*	0.58*	1	0.19	-0.07	-0.05
Chronic Disease	0.09	0.13	0.25	-0.39*	0.32	0.11	0.19	0.19	1	-0.08	-0.11
Body Pain Problem	-0.18	-0.02	-0.22	-0.16	-0.18	0.06	0.28	-0.07	-0.09	1	-0.16
Age	-0.09	0.47*	0.23	0.04	0.17	-0.32	-0.45*	-0.05	-0.11	-0.16	1

Relationship between demographic background and frailty

There was a significant difference in the risk of social function with different education levels ($t = 2.29$, $p < .05$), and the score of elementary school was higher than that of illiteracy; there was a significant difference in the

risk of nutritional status with or without exercise status ($t = 2.81$, $p < .05$), The score of exercise was higher than that of no exercise; there was a significant difference in the risk of nutritional status between smoking status ($t = 0.03$, $p < .05$), and the score of no smoking was higher than that of smoking (Table 6).

Table 6: Analysis of differences between demographic background and frailty (N=30)

Variable	Nutritional Status Risk			Oral Function Risk		Social Function Risk	
	Number of People	M±SD	F/t	M±SD	F/t	M±SD	F/t
education level							
illiterate	8	0.63±0.92	1.46	1.88±0.99	2.02	1.38±0.74	2.29* elementary school > illiterate
elementary school	11	0.09±0.30		1.09±0.83		1.55±0.82	
middle school.high school.	5	0.40±0.55		1.20±0.45		1.20±0.45	
junior college							
university or above	6	0.17±0.41		1.83±0.75		0.50±0.55	
exercise							
yes	26	0.35±0.63	2.81*	1.46±0.91	-0.08	1.23±0.77	-0.05
no	4	0.00±0.00	yes >no	1.50±0.58		1.25±0.96	
smoking							
yes	3	0.00±0.00	0.03*	1.67±0.58	0.42	1.00±1.00	-0.54
no	27	0.33±0.62	no >yes	1.44±0.89		1.26±0.76	
good	15	0.40±0.63	1.78	1.60±0.83	0.53	1.07±0.80	0.72
not good. very bad	6	0.50±0.84		1.17±0.98		1.33±0.82	

* $p < .05$ ** $p < .01$ *** $p < .001$

DISCUSSION

Most of the subjects in this study are women (63.3%). The Ministry of Health and Welfare (2017)^[3] reported the National Prevention and Delay Disability Care Plan. As a result of the implementation, a total of 17,117 people participated in the project services, and the male to female ratio was about 1:3; in this study, 17 people (56.7%) with a total score of 10 or above were among the frail high-risk groups, and 11 people (64.7%) were mostly female, 75-84 years old women accounted for the majority of 5 people (29.4%), Freid et al. (2001)^[6] and Mello et al. (2014)^[16] research results showed that there were more elderly women in the frail group.^[5,6,10,13,16] The age of the subjects in this research is between 63-94 years old, with an average age of 81.10 years old. According to the implementation results of the National Prevention and Delay Disability Care Plan conducted by the Ministry of Health and Welfare (2017)^[32], the average age is 76 years old, and the elderly aged 75-79 are obviously declining similar age groups.^[32] In this study, 20% of the subjects were elderly people over the age of 85. The older they are, the greater the chance of frailty, and the prevalence of frailty among the elderly over 85 years old can reach a quarter.^[11] Analysis of frailty risk groups, with a total score of 10 or more (inclusive) (high-risk frailty group) 17 people (56.7%), the prevalence of frailty among the community elderly over 65 years old in Taiwan was 4.9%, and the frailty

tendency was 40.0%.^[14] The research results of Lupon et al. found that the frailty rate of outpatients with heart failure was 39.9%^[12], which was higher than the research results of some scholars.

According to the analysis of the Frailty Screening Scale, the total score of frailty screening is 325 points (10.8 ± 0.7), and the independent living risk score is the highest, indicating high risk. Do you go out by bus, tram?"; "Do you buy daily necessities by yourself?"; Do you go to the bank to deposit and withdraw money by yourself?", so muscle strengthening exercises are the top priority. The top three in the potential risk group: the first is the motor function risk of 3 points or more, accounting for 17 people (56.7%), the second is the oral function risk of 2 points or more, accounting for 13 people (43.3%), and the third is the psychological function risk of 2 points More than 9 people (30.0%). The top three frailty risk groups: the first is cognitive function risk score 1, accounting for 25 people (83.3%), followed by social function risk score 2, accounting for 13 people (43.3%) and oral function risk score 2, accounting for 13 people (43.3%) %), the third was motor function risk 3 points, accounting for 11 people (36.7%). Plan the theme of preventive care, including muscle strengthening exercises, oral health care, dietary nutrition, cognitive promotion and social participation, etc., to prevent the frail elderly from becoming disabled or demented, and

delay the rapid deterioration of the disabled or demented elderly.^[32]

Independent living risk was positively correlated with the sum of frailty screenings ($r = .66, p = .01$), with the highest mean for independent living risk being "whether one usually travels alone by public transportation (e.g. MRT, bus, tram)" ($M=0.80$); the risk of motor function was positively correlated with the total frailty screening ($r = .48, p = .01$). In terms of risk of motor function, the highest total score of 18 was divided into "whether there was a fall in the past year or not?" Ever?", "Are you very worried about falling?" ($M=0.60$); 26 people (86.7%) exercised to prevent falls caused by sarcopenia; risk of motor function and age ($r = .47, p = .05$) was positively correlated, older age, higher risk of motor function, the research results are the same as some scholars^[18-25]; Oral function risk and chronic disease ($r = -.39, p = .05$) was negatively correlated. Among the chronic diseases in this study, 13 (14.9%) had high blood pressure, 11 (12.6%) had diabetes, and 6 (46.1%) had low back pain. Chronic diseases or multiple diseases can also cause oral High functional risk.^[24,30] In terms of oral function risk, the highest average was "Compared with six months ago, are you less able to eat hard things?", "Have you ever lost more than 2-3kg in weight within 6 months" accounted for 6 people (20.0%); The lowest average was "BMI less than 18.5", accounting for 3 people (10.0%); the risk of oral function can lead to malnutrition.^[24,30] The Ministry of Health and Welfare (2017)^[32] reported the implementation results of the National Prevention and Delay Disability Care Program. A total of 17,117 people participated in the program services. The average age was 76 years old, and the frail elderly accounted for about 67%. The results found that the scores of the participants in independent living, exercise, nutrition, oral cavity, social interaction, dementia, depression and comprehensive potential nursing risks were significantly improved compared with those before participating in the activity^[32,33], risk of social functioning was positively associated with frailty screening summaries ($r = .61, p = .001$), with higher social participation associated with slower onset of frailty. Cognitive function risk was positively correlated with psychological function risk ($r = .41, p = .05$). In terms of psychological function risk, the highest total score was "in the past two weeks, have you felt tired or burnt out for no reason?" and the occurrence of depression Case ratios are high.^[24,29,30] with partially the same results. Cognitive risk was positively associated with frailty screening totals ($r = .58, p = .051$), and cognitive risk was inversely associated with age ($r = .45, p = .05$). The older you are, the greater the chance of cognitive frailty, and the prevalence of frailty in people over the age of 85 can reach a quarter.^[11]

The results of different personal background influencing factors in this study: "Educational level", "Exercise status" and "Smoking status" items have significant differences in the risk of frailty. There is a significant difference in the risk of motor function with different

education levels ($t = 2.29, p < .05$), and the score of elementary school is higher than that of illiteracy; in this study, the education level of elementary school is 11 (36.7%), which is the same as the research results of some scholars.^[15,19,21,25] Whether there is a significant difference in the risk of nutritional status with or without exercise status ($t = 2.81, p < .05$), the score with exercise is higher than that without exercise, and scholars have studied the lack of physical activity or exercise in terms of life style, the more frailty occurs. Nutritional status is at high risk.^[15,24,29] There was a significant difference in the risk of nutritional status with or without smoking status ($t = 0.03, p < .05$), and the score of non-smokers was higher than that of smokers. In this study, 3 smokers (10.0%), the results of the study were consistent with those of Teo et al. (2017)^[26] are the same.

CONCLUSIONS

According to the analysis of the frailty risk group based on the research results, there are 17 people (56.7%) with a total score of 10 points or more (high-risk frailty group), 11 of whom are women (64.7%), and women aged 75-84 account for 5 People (29.4%). Among the potential risk groups, the top two were motor function risk of 3 points or more, accounting for 17 people (56.7%), and oral function risk of 2 points or more, accounting for 13 people (43.3%). The risk of independent living was positively correlated with the sum of frailty screening; the risk of motor function was positively correlated with the sum of frailty screening; the risk of oral function was negatively correlated with the sum of chronic disease; the risk of social function was positively correlated with the sum of frailty screening; Frailty screening was positively associated total and negatively associated with age. Personal background: The items of "education level", "exercise status" and "smoking status" had significant differences in the risk of frailty. A reliable and valid tool for screening and assessing the frailty of the elderly, can identify high-risk groups, and promote "prevention and delay of disability care programs", including muscle strengthening exercises, oral health care, dietary nutrition, cognitive promotion and social participation Such care programs can prevent the frail elderly from becoming disabled or demented. Frailty assessment is meaningful for the health risk assessment level of the elderly group. It should be extended to elderly care centers or long-term care institutions, and then related preventive plans and strategies can be developed.

ACKNOWLEDGMENTS

This study was supported by the Central Taiwan University of Science and Technology(2022 of Chung Taiwan University of Science and Technology of Featured research plan).

REFERENCES

1. United Nations (2019, June 19)·World Population Prospects (World Population Prospects 2019).<https://unstats.un.org/home/>.

2. National Development Council (2020, August). Republic of China Population Estimates (2020-2070). https://www.ndc.gov.tw/Content_List.aspx?n=695E69E28C6AC7F3.
3. Ministry of Health and Welfare (2016). Long-term care ten-year plan 2.0 (106~115 years). [https://file:///C:/Users/user/Downloads/1051219%E9%95%B7%E7%85%A72.0%E6%A0%B8%E5%AE%9A%E6%9C%AC%20\(2\).pdf](https://file:///C:/Users/user/Downloads/1051219%E9%95%B7%E7%85%A72.0%E6%A0%B8%E5%AE%9A%E6%9C%AC%20(2).pdf).
4. Yang M, Lin H, Xie J, Xu Z, Zhang. Analysis and suggestions on delaying and preventing debilitating care policies for the elderly in Taiwan. *Journal of Taiwan Geriatrics and Gerontology Society*, 2019; 14(2): 53-65.
5. Zhang X, Tan SS, Franse CB, Alhambra-Borrás T, Durá-Ferrandis E, Bilajac L, Markaki A, Verma A, Mattace-Raso F, Voorham AJJ, Raat H. Association between physical, psychological and social frailty And health-related quality of life among older people. *Eur J Public Health*, 2019; 29: 936-942. doi:10.1093/eurpub/ckz099.
6. Fried LP, Tangen CM, Walston J, Newman AB, Hirsch C, Gottdiener T, Tracy R, Kop WJ, Burke G, McBurnie MA. Frailty in older adults: Evidence for a phenotype. *The Journals of Gerontology Series A*, 2001; 56(3): M146-M157. doi:10.1093/gerona/56.3.M146
7. Gill TM, Gahbauer EA, Allore HG, Han L. Transitions between frailty states among community-living older persons. *Arch Intern Med.*, 2006; 166: 418-423.
8. Ensrud KE, Ewing SK, Cawthon PM, Fink HA, Taylor BC, Cauley JA, Dam TT, Marshall Lynn M, Orwoll Eric S, Cummings Steven R. A comparison of frailty indexes for the prediction of falls, disability, fractures, and mortality in older men. *J Am Geriatr Soc.*, 2009; 57: 492-498.
9. Wu F, Chen Q, Xu Z, Xie B. Three stages and five levels of prevention for the elderly guided by frailty. *Taiwan Medical Circle*, 2013; 56: 17-22.
10. Gobbens RJ, Schols JM, Van Assen MA. Exploring the efficiency of the tilburg frailty indicator: a review. *Clin Interv Aging*, 2017; 12: 1739-1752.
11. Hoogendijk EO, Afilalo J, Ensrud KE, Kowal P, Onder G, Fried LP. Frailty: implications for clinical practice and public health. *Lancet*, 2019; 394: 1365-1375.
12. Lupon J, Gonzalez B, Santaquenia S, Altimir S, Urrutia A, Más D, Díez C, Pascual T, Cano L, & Vicente V. Prognostic implication of frailty and depressive symptoms in an outpatient population with heart failure. *Rev Esp Cardiol*, 2009; 61: 835-842.
13. Lu Beilei, Zhang Shuling, Chen Jingying, Wu Zhixun, Zhang Jingyi, Chen Qingyu. Analysis of frailty in the elderly with chronic diseases in outpatient clinics. *Taiwan Journal of Gerontology and Gerontology*, 2010; 5(1): 36-49. doi:10.29461/TGG.201002.0004
14. Chen CY, Wu, SC, Chen LJ, Lue BH. The prevalence of subjective frailty and factors associated with frailty in Taiwan. *Arch Gerontol Geriatr*, 2010; 50: S43-47.
15. Van Oostrom SH, van der DL, Rietman ML, J Picavet HS, Lette M, Monique Verschuren M, de Bruin S. RW, Spijkerman A M. A four-domain approach of frailty explored in the Doetinchem Cohort Study. *BMC geriatr*, 2017; 17: 196.
16. Mello AC, Engstrom EM, Alves LC. Health-related and socio demographic factors associated with frailty in the elderly: A systematic literature review. *Cadernos de Saude Publica*, 2014; 30(6): 1143-1168. doi:10.1590/0102-311x00148213.
17. Gobbens RJ, van Assen MA, Lujck KG, Wijnen Sponselee MT, Schols JM. The Tilburg Frailty Indicator: psychometric properties. *J Am Med Dir Assoc*, 2010; 11: 344-355. Doi:10.1016/j.jamda.2009.11.003.
18. Makizako H, Shimada H, Doi T, Tsutsumimoto K, Hotta R, Nakakubo S, Makino K, Lee S. Social frailty leads to the development of physical frailty among physically non-frail adults: a four-year follow-up longitudinal cohort study. *Int J Environ Res Public Health*, 2018; 15: E490. doi:10.3390/ijerph15030490.
19. Andrew MK, Keefe JM. Social vulnerability from a social ecology perspective: a cohort study of older adults from the National Population Health Survey of Canada. *BMC Geriatr*, 2014; 14: 90. doi:10.1186/1471-2318-14-90.
20. Andrew MK, Mitnitski AB, Rockwood K. Social vulnerability, frailty and mortality in elderly people. *PLoS One*, 2008; 3: e2232. doi:10.1371/journal.pone.0002232.
21. Andrew MK, Mitnitski A, Kirkland SA, Rockwood K. The impact of social vulnerability on the survival of the fittest older adults. *Ageing*, 2012; 41: 161-165. doi:10.1093/ageing/afr176.
22. Andrew MK, Rockwood K. Social vulnerability predicts cognitive decline in a prospective cohort of older Canadians. *Alzheimers Dement*, 2010; 6: 319-325. doi:10.1016/j.jalz.2009.11.001.
23. Tsutsumimoto K, Doi TMakizako H, Hotta R, Nakakubo S, Makino K, Suzuki T, Shimada H. Association of social frailty with both cognitive and physical deficits among older people. *J Am Med Dir Assoc*, 2017; 18: 603-607. doi:10.1016/j.jamda.2017.02.004.
24. Zhao JK, Zhang XX, Li ZM. The relationship between cognitive impairment and social vulnerability among the elderly: evidence from an unconditional quantile regression analysis in China. *Int J Environ Res Public Health*, 2019; 16: E3684. doi:10.3390/ijerph16193684.
25. Van Assen M, Pallast E, Fakiri FE, Gobbens RJ. Measuring frailty in Dutch community-dwelling older people: reference values of the Tilburg Frailty Indicator (TFI). *Arch Gerontol Geriatr*, 2016; 67: 120-129. Doi:10.1016/j.archger.2016.07.005.

26. Teo N, Gao Q, Nyunt MSZ, Wee SL, Ng TP. Social frailty and functional disability: findings from the Singapore longitudinal ageing studies. *J Am Med Dir Assoc*, 2017; 18: 637e13-e19. Doi:10.1016/j.jamda.2017.04.015.
27. Verver D, Merten H, de Blok C, Wagner C. A cross sectional study on the different domains of frailty for independent living older adults. *BMC Geriatr*, 2019; 19: 61. doi:10.1186/s12877-019-1077-3.
28. Wu P, Hou M, Zhang J, Zhang Qg, Chen Q, Yang Y, Zhang J, Wu Z. Prevalence and related risk factors of frailty among elderly men in remote areas of southern Taiwan. *Taiwan Journal of Geriatrics and Gerontology*, 2011; 6(3): 161-175. doi: 10.29461/TGG.201108.0002.
29. Yoo M, Kim S, Kim BS, Yoo J, Lee S, Jang, H C, Cho B L, Son S J, Lee J H, Park YS, Roh E, Kim HJ, Lee SG, Kim BJ, Kim MJ, Won, CW. Moderate hearing loss is related with social frailty in a community-dwelling older adults: the Korean Frailty and Aging Cohort Study (KFACS). *Arch Gerontol Geriatr*, 2019; 83: 126-130. doi:10.1016/j.archger.
30. Park H, Jang IY, Lee HY, Jung HW, Lee E, Kim DH. Screening value of social frailty and its association with physical frailty and disability in community dwelling older Koreans: aging study of Pyeong Changr uralarea. *Int J Environ Res Public Health*, 2019; 16: E2809. doi:10.3390/ijerph16162809.
31. Shega JW, Andrew M, Hemmerich J, CagneyKA, Ersek M, Weiner D K, DaleW. The relationship of pain and cognitive impairment with social vulnerability: an analysis of the Canadian Study of Health and Aging. *Pain Med.*, 2012; 13: 190-197. doi:10.1111/j.1526-4637.2011.01309.x.
32. Ministry of Health and Welfare (2019, March 20). 2017 Survey Report on the Status of the Elderly · <https://dep.mohw.gov.tw/dos/lp-1767-113.html>.
33. Cai S, Chen S, Lu S, Liu L. Policy and practice of preventive care for the elderly. *Journal of Nursing*, 2018; 65: 13-9.
34. National Health Service, Ministry of Health and Welfare (2018, January 9). 2018 National Health Department Community Prevention and Delay Disability Care Businessintroduction. <https://hpa.empower.utaipei.edu.tw/login>.