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Original Article

Risk Factors of Frailty Among Multi-Ethnic Malaysian Older Adults

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SUMMARY

Background: Malaysia is experiencing an increase in the percentage of older people who have a higher life expectancy. However, information regarding the prevalence and risk factors of frailty is scarce for Malaysian older adults. The aim of this cross-sectional study is to determine the prevalence and risk factors of frailty among multi-ethnic community dwellings for older adults in Malaysia.
Methods: A total of 473 older adults aged 60 years and above (210 men and 263 women) were randomly selected from 10 different areas in the Klang Valley of Malaysia. The respondents were screened at selected community centres; their frailty status was defined using Fried's criteria. Respondents were assessed for their physical functional status using selected parameters of a senior fitness test and other physical performance tests regarding their activities in daily life. Anthropometric measurements, cognitive function and symptoms of depression were also assessed for each respondent.
Results: The prevalence of frailty was 8.9% and of pre-frailty was 61.7%, with women having a higher prevalence compared to men ($p < 0.01$). Binary logistic regression analyses showed that female gender, abdominal obesity, low peak respiratory flow rate score and slower rapid pace gait speed were significant predictors of frailty.
Conclusion: Frailty affected about one tenth of the respondents, but almost two thirds were pre-frail. In addition to gender, other modifiable factors including abdominal obesity and poor physical function were identified as risk factors for frailty and pre-frailty among Malaysian older adults.
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1. Introduction

In 2012 there were around 810 million older adults aged 60 and above in the world and this number is expected to increase[1]. Therefore, it is pressing to provide comprehensive information for evidence based strategies to maintain physical and cognitive function and decrease the level of disability in older adults[2]. Frailty is a relatively new concept in the geriatric field and it is considered to be one of the major risk factors of disability in older adults[3]. Frailty is defined as "a biological syndrome of decreased reserve and resistance stressors, characterized by muscle weakness, sarcopenia and fatigue" and is associated with several adverse health outcomes[4]. There are serious consequences of frailty in older individuals, their families and society as they are at the midway between independence and disability, hospitalization and mortality[5]. Risk factors of frailty identified in different communities so far include old age[6–9], ethnicity[8,10], co-morbidities[7–9], economic status and educational level[6,10].

Noticeably, Malaysia is witnessing an increase in the percentage of older people aged 60 years and above due to considerable socioeconomic and demographic transmutation[11]. Malaysia is expected to transform to an aging population by the year 2020, with older adults making up 11.3% of the total population[12]. A recent study among older Malaysian urban dwellers indicated that frailty affected 5.7%, with physical function disability, falls and cognitive impairment found to be the risk factors[13]. However, this study employed a convenient sampling method and the contribution of nutrition and physical function were not investigated adequately. These risk factors are potentially modifiable factors that need to be addressed by public health strategies. Thus, the aim of this study is to determine the prevalence of frailty and its related risk factors through a wide range of physical, cognitive and nutritional factors among multi-ethnic Malaysian older adults recruited through a multistage random sampling.

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2. Materials and methods

This study is part of a longitudinal study on a neuroprotective model for healthy longevity among Malaysian older adults, as previously published[14]. The study protocol was approved by the Ethics Committee of the Ministry of Health, Malaysia. Respondents were selected using a multistage random sampling from ten urban and rural districts, in which older adults formed 10% or more of the total population, this being a representative sample of community-dwelling older individuals and comprising the three main ethnic groups (Malays, Chinese and Indians)[11]. Eligible older adults aged 60 years and above with no known terminal or mental illnesses were visited at the homes and invited to join a health screening session at community centres (Fig. 1). Of the 650 invited, 574 participated and signed the consent form. Data was collected from 15th July 2013 to 22nd February 2014. Respondents were interviewed regarding their sociodemographic data, and they were asked to report if they had been diagnosed with any chronic diseases or other medical problems. Participants who had medical problems that prevented them from performing the physical functional assessment, acute illness during the data collection, low MMSE score (<16) or who were unable to follow the instructions when performing the measurements, were excluded from the study.

The frailty assessment was done using Fried's criteria[10]. It consists of five components: shrinking (subjective report of unintentional weight loss of 5 kg and above over the last year); weakness (hand grip is less than the cut-off points mentioned on the original reference, adjusted for gender and body mass index); exhaustion and poor endurance and energy (indicated by self-reporting of exhaustion, identified by two questions from the CES-D scale); slowness (gait speed more than the cut-off points mentioned on the original reference, adjusted for gender and height); and low physical activity, identified by low scores (in the lowest tertile) of the physical activity scale for elderly (PASE).

Anthropometric measurements included weight, height, mid upper arm circumference (MUAC) and calf circumference (CC). All measurements were taken twice using the standard method[15]. The physical functional status assessment included activities of daily living, instrumental activities of daily living and selected parameters in the senior fitness test[16], including a 2-min step for endurance, hand grip and shoulder strength for upper body strength, chair stand for lower body strength, set and reach for lower body flexibility, back scratch for upper body flexibility, time up and go test for balance and mobility status, normal and rapid pace gait speed test and, in addition, peak expiratory flow test for respiratory function. The impairment in any of the physical function tests were determined by the lowest percentile of the total sample. The activity of daily living (ADL) using the Barthel Index Score[17] and instrumental activity of daily living (IADL) using Lawton IADL[18] were also obtained. Cognitive function was assessed with the mini mental status examination (MMSE), using the validated Malaysian version[19]. Depressive symptoms were screened using the short version of the geriatric depression scale (GDS-15), with those scoring 5 or above of the total score of 15 categorised as having depressive symptoms[20]. A total of 20 ml of blood was collected in different tubes by a trained phlebotomist. Albumin, fasting blood sugars (FBS), glycosylated haemoglobin (HBA1c) and lipid profiles were conducted at the Path Lab−Pathology and Clinical Laboratory (m), Sdn Bhd, Klang Valley branch, Malaysia.

All statistical analyses were carried out using the Statistical Package for Social Sciences (SPSS) software, version 21.0. An alpha level of (0.05) was considered for all the statistical tests used in the study. Two sided p values of (0.05) and (80%) power were considered to be statistically significant. In order to determine the frailty risk factors, a univariate analysis using the chi square test was performed. Further analysis using hierarchical binary logistic regression was done to determine the frailty risk factors in a multivariate model. The logistic assumptions multicollinearities and outliers were checked. Hosmer-Lemeshow goodness of fit test was employed to assess how well the model fit the data.
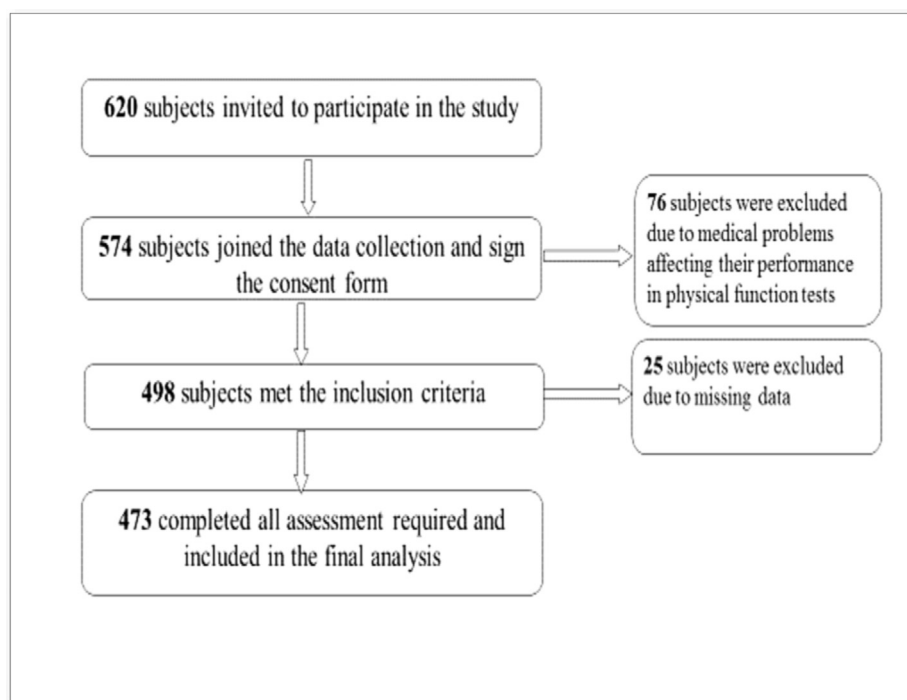

Fig. 1. Participant's recruitment flow chart.