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Brief Communication

The Pictorial Fit-Frail Scale Malay Version (PFFS-M): Predictive Validity Testing in Malaysian Primary Care

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Abstract

The purpose of this study was to evaluate the association between Pictorial Fit Frail Scale-Malay version (PFFS-M) and adverse outcomes, such as falls, new disability, hospitalisation, nursing home placement, and/or mortality, in patients aged 60 and older attending Malaysian public primary care clinics. We assessed the baseline PFFS-M levels of 197 patients contactable by phone at 18 months to determine the presence of adverse outcomes. 26 patients (13.2%) reported at least one adverse outcome, including five (2.5%) who fell, three (1.5%) who became disabled and homebound, 15 (7.6%) who were hospitalized, and three (1.5%) who died. Using binary multivariable logistic regression adjusted for age and gender, we found that patients who were at-risk of frailty and frail at baseline were associated with 5.97(95% CI [1.89-18.91]; P=0.002) and 6.13 (95% CI [1.86-20.24]; P= 0.003) times higher risk of developing adverse outcomes at 18 months, respectively, than patients who were not frail. The PFFS-M was associated with adverse outcomes.

Key words: PFFS, frailty, screening tool, primary care.

Introduction

Population ageing is a global phenomenon, with the number of persons aged 60 and above rising from 200 million in 1950 to 1 billion by 2020, and 2 billion by 2050 (1). Improved healthcare, lower mortality rates, improved socioeconomic development and lower fertility rates have contributed to this achievement (1). In the midst of this unprecedented demographic shift, low and middle-income countries such as Malaysia are ageing much faster than developed countries, with significant implications for health and social care planning and delivery (2).

Malaysia is expected to become an aged nation by 2030, with 15% of the population aged 60 or older (3). As the population ages, the prevalence of age-related conditions such as frailty will rise, making it critical that the healthcare system evolves to better meet the health needs of this growing population group (1, 4).

Frailty is a state of vulnerability caused by cumulative physiological decline over a lifetime, which increases the risk of developing adverse health outcomes such as falls, disability, hospitalisation, institutionalisation, and death following a stressor (5). Frailty prevalence among Malaysian community-dwelling older adults is estimated to be between 5.7% and 9.4% (6, 7).

Frailty, however is reversible and interventions such as exercise and nutrition can help reduce its incidence or impact (8). Therefore, early detection of frailty is critical and we previously proposed that frailty screening programmes be implemented in Malaysia through government-funded primary care services.

The two most used frailty definitions are the phenotypic approach of Fried et al (9) and the frailty index of Rockwood and Mitnitski (10). Frailty is defined by the Fried phenotype as having three or more of the following five characteristics: weak grip strength, slow walking speed, weariness, low physical activity, and accidental weight loss, however Rockwood and Mitnitski utilise the number of «deficits» to calculate a frailty index. These procedures, however, are impractical for identifying frailty in primary care since they are time consuming and involve physical performance measurements.

There are several time efficient and validated screening tools recommended for identifying frailty in older adults in primary care, including the FRAIL scale, the Clinical Frailty Scale (CFS), the Vulnerable Elders Survey-13 (VES-13), the Kihon checklist (KCL), and the Study of Osteoporotic Fractures (SOF) (11). However, these tools have several limitations. The FRAIL and the SOF scales identify frailty with only a small number of symptoms (12, 13) The KCL and the VES-13, assesses multiple health domains and are more comprehensive, but still leave out some important elements such as polypharmacy, continence, pain, vision, and hearing (14, 15). Despite its pictorial design, the CFS requires clinical judgement because it was designed to summarise a comprehensive assessment (16).

The Pictorial Fit Frail Scale (PFFS) is a novel frailty screening tool developed by Theou and Rockwood that comprehensively assesses across 14 health domains (17). The PFFS is reliable when administered by patients, caregivers, and the healthcare professionals in various clinical settings (18–21). Because the PFFS is pictorial in nature, it overcomes language and health literacy barriers; thus, it is suited for

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Malaysia's multi-ethnic and multi-lingual population, where poor health literacy is high (22, 23). The PFFS was translated into the Malay language, giving rise to the PFFS-M (Pictorial Fit Frail Scale- Malay version) (24). The reliability and validity of the PFFS-M were established for use with older Malaysians attending publicly funded primary care clinics and cut-offs (i.e. score 6 and above) were also determined to identify frailty when the frailty index was used as the reference method (18) The next step was to investigate the association between the PFFS-M and adverse health outcomes, which had not previously been studied in the primary care setting.

The goal of this study was therefore to determine the association of the PFFS-M across all frailty levels and adverse outcomes defined as death or the presence of either falls, disability, hospitalisation, or nursing home placement.

Methods

Ethics approval

This study reported here complies with the Declaration of Helsinki and was approved by the University of Adelaide Human Research Ethics Committee (HREC- H-2017-149) and the Medical Research and Ethics Committee of the Ministry of Health Malaysia (NMRR-17-543-34884).

Study sample

This study was powered to assess agreement between raters at baseline and determine the reliability and validity of the PFFS-M (25). Two hundred and forty subjects were recruited from four public primary healthcare clinics between April and December 2018 and the results of the baseline study have been published (18). Universal sampling was applied and attempts to contact all patients at 18 months were made. Detailed information about this study sample has been described elsewhere (18).

Study Setting

This research was conducted in four primary care clinics operated by the Ministry of Health of Malaysia in the states of Selangor (Peninsular Malaysia) and Sarawak (Borneo Malaysia). Each state had one rural and one urban clinic involved.

Baseline recruitment

Eligibility criteria for participation included being able to understand Malay, not being acutely ill, having good vision, and presenting with a primary caregiver who would also participate (17).

Baseline Assessments

For this study, the PFFS-M was used to identify patients' frailty levels at the baseline. The PFFS-M is a pictorial tool that scores across fourteen health domains including mobility, function, cognition, social support, affect, medication, incontinence, vision, hearing, balance and aggression (17). For each domain, scores ranging from 3-6 are recorded, with the best health on the left and the worst health on the right. A higher total score indicates greater frailty, with a maximum total score of 43. Participants were excluded if more than 20% of the data was missing (26) We identified frailty levels using the previously identified PFFS-M cut-offs: a) non-frail (PFFS-M scores 0-3); b) at-risk of frailty (PFFS-M scores 4-5); and c) frail (PFFS-M scores 6 and above) (18).

Age and gender were collected as baseline variables and were used as covariates. Ethnicity, marital status, education level, occupational status, household income, house ownership, living conditions, alcohol consumption, educational level, and smoking status were also used to characterise the study cohort.

Outcomes Assessment: Follow up after 18months

After 18 months, all patients were contacted by phone using their or their primary caregivers' phone numbers. Patients and/ or primary caregivers who could not be reached at the phone numbers previously registered were phoned two more times, one day apart, before being deemed uncontactable.

Once contact had been established, self-reported data were recorded. The participant's survival was confirmed during the phone call, with deaths reported by the deceased's next of kin. Participants were asked if they had experienced any of the following events in the previous 18 months: a) falls; b) new disability; c) nursing home placement; d) hospitalisation; and e) death. Disability was defined as difficulty or dependency in mobility (walking, moving outdoors) and performing activities necessary for independent living, including self-care tasks such as walking indoors, using the toilet, washing, bathing, dressing and undressing, feeding) (27). Nursing home placement was defined as permanent placement in a long-term care institution (28). Hospitalisation was defined as a hospital admission for at least one day. Adverse outcomes included any of the events outlined above.

Statistical Analysis

The Statistical Package for Social Sciences (SPSS) software version 25 was used to analyse the data. Descriptive statistics are reported as means with standard deviations (SD) or percentages. Chi-square and independent t-tests were used to compare baseline characteristics of those contacted and uncontacted at 18 months. All tests were two-sided with a $p< 0.05$ significance level. A binary multivariable logistic regression adjusted for age and gender, was used to investigate the association between adverse outcomes (Yes/ No) at 18 months and baseline PFFS-M frailty categories: non-frail (PFFS-M scores 0-3); at-risk of frailty (PFFS-M scores 4-5); and frail (PFFS-M scores 6 and above). A Hosmer-Lemeshow goodness-of-fit test indicated that the assumption of proportional odds was met.