Original Article

Application of a World Health Organization 10-minute screening tool in eastern Taiwan—Falls and self-rated health status among community-dwelling elderly

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ABSTRACT

Objectives: Falling is a major health risk facing the elderly. The prevalence of falls is 20.5% among adults older than 65 years in Taiwan. Our study used a geriatric screening tool to identify elderly people at high risk of falls.
Materials and Methods: Our study used a 10-minute geriatric screening tool developed by the World Health Organization to survey geriatric health problems and evaluated its effectiveness in a population of elderly Taiwanese. There were 186 participants who were $\geq$ 65 years old. All participants were inter-viewed by trained volunteers using the screening tool.
Results: The prevalence of falls was 28.3%, depression 13.4%, and urinary incontinence 29.9% in the previous year. Health issues in the elderly associated with a history of falls included depression ($p < 0.001$), urinary incontinence in the previous year ($p = 0.004$), and urinary incontinence in the previous week ($p = 0.007$). Protective factors against falls included the ability to walk fast ($p < 0.001$), get to places out of walking distance ($p < 0.001$), and perform heavy work ($p < 0.001$). The logistic regression analysis revealed that depression was positively correlated with a history of falling ($p = 0.023$), whereas the ability to walk fast presented a negative correlation ($p = 0.015$).
Conclusion: The World Health Organization 10-minute screening tool can be rapidly and easily imple-mented in a primary care clinical setting. It can also improve the identification of elderly persons living in the community at high risk of falling.
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1. Introduction

Falling is a major health risk facing the elderly. In the United States and United Kingdom, one out of three older adults experi-ences a fall each year [1,2]. In Taiwan, the prevalence of falls is 20.5% among adults older than 65 years, and 27.3% suffer serious injuries as a consequence of falling [3]. In addition to the pain and reduced quality of life, the prevalence and associated costs of falls among the elderly make it a major public health issue.

The World Health Organization (WHO) has listed falls/immo-bility, cognitive impairment, urinary incontinence, and depression as the "four giants of geriatrics," a designation that reflects the large number of individuals afflicted by these problems [4]. Studies have shown that these four problems are also the major risk factors for falls [5–8]. Several guidelines for the prevention of falls have emphasized the need for all people aged $\geq$ 65 years to be screened for the risk factors associated with falling every 12 months. The interactions between multiple risk factors must also be taken into account [9,10].

The Comprehensive Geriatric Assessment is a multidimensional, multidisciplinary diagnostic and treatment process that identifies medical, psychosocial, and functional limitations in the elderly in order to develop a sustainable plan to maximize overall health with aging [11]. In Taiwan, people older than 65 years are entitled to an annual health checkup paid for by the government. This health checkup was modified from the Comprehensive Geriatric Assessment and was designed to improve health services for the elderly. The items listed in the health checkup include risk factors related to health-threatening behaviors, two questions about depression, and data related to liver and renal function, lipid profiles, and blood glucose levels. This health checkup does not cover all major health issues facing the elderly; however, the time required to complete a comprehensive assessment tool might limit its applicability [12].

Previously, there was no time-saving, easy-to-use screening tool available. WHO developed a comprehensive geriatric screening tool based on the principles of the Active Ageing Policy Framework. This tool addresses the physical condition and health issues most often encountered by the elderly [4]. In addition, it is easily implemented by trained personnel in a primary care setting. We conducted a pilot study of the WHO 10-minute comprehensive screening tool in a suburban community. We also evaluated the time and manpower used in applying this screening tool in an aging community.

2. Methods and Materials

The study was conducted from March 2011 through July 2011 at three communities in Fonglin town in eastern Taiwan. All residents aged ≥ 65 years who lived in the selected communities ($n = 623$) were invited to the primary health care (PHC) center for an annual health checkup. Of these, 221 participants (35.5%) completed the examination. We excluded those who were institutionalized ($n = 14$), too ill to complete the screening ($n = 6$), or wheelchair-bound ($n = 15$) for a total of 186 participants. The items in the checkup included an assessment of health-threatening behaviors, screening for depression, a physical examination, liver and renal function tests, an evaluation of the risks for metabolic syndrome, and cancer screening.

In addition to the traditional health checkup, all participants were interviewed in the waiting room by well-trained volunteers using the 10-minute screening tool. Prior to the day of screening, the volunteers received 1 hour of training regarding how to present the survey and complete the examination.

The 10-minute screening consisted of 15 items and comprised five competences: (1) memory (3-item recall test); (2) urinary incontinence (2 items, "Have you lost urine and gotten wet in the past year" and "in the past week"); (3) depression (2 items, "Did you often feel sad or depressed in the past 2 weeks" and "Did you feel little interest or pleasure in the last 2 weeks"); (4) falling ("Have you fallen 2 or more times in the past 12 months?"); and (5) functional daily capacity [6 items, run/fast walk (such as run/walk fast to catch a bus), heavy work around the house (such as washing windows, walls or floors), go shopping, get to places out of walking distance (drive, take a bus), bathing, and dressing]. The original version includes evaluation of nutrition, vision, and hearing. It was excluded in our study because those items cannot be tested accurately in the community setting because of environmental factors. If screening returned positive values for any of the four geriatric giants, the patient was referred to a doctor for further examination.

The instrument was translated into Chinese from the English version and then back-translated into English to recheck its similarity with the original version. To establish good content validity for the Chinese version, we consulted three experts (1 family medicine specialist, 1 associate professor in public health, and 1

director of the PHC) to evaluate the screening items. Each of the items was rated as essential by the experts.

The data were analyzed using SPSS version 20.0 (IBM Corp., Armonk, NY, USA) for Windows. Descriptive analysis was used to describe the prevalence of geriatric problems and functional status. Univariate analysis was performed for risk factors of falls using Chi-square statistics. Logistic regression analysis was also performed for variables that were significant in the univariate analysis. A p value < 0.05 was considered statistically significant.

3. Results

A total of 186 residents were included in the study. All study participants were aged ≥ 65 years (34.8% male; 65.2% female). The results of the WHO 10-minute comprehensive screening showed a prevalence of falls of 28.3%, depression 13.4%, and urinary incontinence 29.9% in the previous year. In the previous week, 16.6% of the participants had experienced urinary incontinence. On the memory test, approximately one-half of the participants (51.3%) were unable to recall at least one of three items, indicating the possibility of cognitive impairment. More than 95% of participants could go shopping, bathe, and dress by themselves. For more challenging physical tasks, these results dropped noticeably. The ability to run or walk fast was 50.3%, get to places beyond walking distance 77.0%, and perform heavy work around the house 53.5% (Table 1). As an index of internal consistency, the Cronbach α values for urinary incontinence, depression, and physical capacity in daily life were 0.747, 0.696 and 0.674, respectively.

Health issues common in the elderly that were associated with a history of falls included depression ($p < 0.001$), and urinary incontinence in the past year ($p = 0.004$) and in the past week ($p = 0.007$). Physical factors related to falls included the ability to run or walk fast ($p < 0.001$), get to places out of walking distance ($p < 0.001$), and perform heavy work around the house ($p < 0.001$; Table 2).

In multivariate analysis, the variable of urinary incontinence in the previous year was excluded because of its collinearity with the same history in the previous week. We performed a logistic

Table 1
Demographics of elderly in community screening.

	$N = 186$
	N (%)
Age (y)	
65—69	51 (27.3)
70—74	61 (32.6)
75—79	37 (19.8)
80—84	27 (14.4)
>85	11 (5.9)
Sex	
Male	65 (34.8)
Female	122 (65.2)
Fall history (fallen ≥ 2 times in the past 12 mo)	
Yes	53 (28.3)
Cognitive impairment (3 items recall)	
Yes	96 (51.3)
Urinary incontinence	
In the past week	31 (16.6)
In the past year	56 (29.9)
Depressive mood	
"Little interest or pleasure in past 2 weeks?"	25 (13.4)
Physical capacity in daily life	
Run/fast walk	94 (50.3)
Heavy work around the house	100 (53.5)
Go shopping	179 (95.7)
Get to places out of walking distance	144 (77.0)
Bath	183 (97.9)
Dress	183 (97.9)