ORIGINAL RESEARCH

Functional Health Status of the Elderly in Taiwan

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Abstract

Purpose: The purpose of the study is to understand the functional health status of the elderly in Taiwan by using the Chinese version of Minimum Data Set—Home Care (MDS-HC) as a health assessment measurement.

Design and methods: Study participants were randomly recruited from southern Taiwan through a two stage strata (Urban/Rural and County/Township) sampling method. The finalized valid study participants were 402. In-person interviewers (n = 12) for this project were professional nurses who were required to attend three MDS training sessions. The average length of data collection (interviewing) was 40 minutes. Data were assessed for inter-rater reliability. Multi-functional information from the following were gathered from participants for analysis: cognitive patterns; communication/hearing; vision; mood and behavior patterns; social functioning; informal support services; physical functioning; continence; disease diagnoses; health conditions and preventive health measures; nutrition/hydration status; dental status; skin condition; environmental assessment; service utilization; and medication information.

Results: 82% of the participants rated themselves as healthy and functional older community residents. Subjectively, they considered themselves having no problem with daily functional activities/independence; however, data show the elderly are in need of the following community services: preventive health (99.8%); psychotropics (94.8%); visual function (59.2%); social function (49.8%); health promotion (36.1%); and reduction of formal services (31.3%). Additionally, the Client Assessment Protocol (CAP) triggers several potential problems.

Implications: Findings support that specific services should be made available to community-dwelling older adults in Taiwan in order to promote their health status.

Keywords: health status, health needs, elderly, CAP triggers

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Introduction

The aim of this paper is to discover the functional health status of the elderly in Taiwan through the Minimum Data Set—Home Care (MDS-HC) assessment tool. The study of aging process is an ancient subject but has recently become a very popular science. Although complex, it should be examined from a systematic approach. It can be from emotional, physiological, economic, social, cognitive, or psychological perspectives. Each viewpoint adds a dimension to the broader understanding of what it means to age personally, socially, and globally. Until now, researchers use "successful aging" as the optimal outcome for aging successfully.[1] Empirically, they stated "studies on successful aging can be divided into two components: clinical standards by which successful aging is measured and psychosocial theories exploring the process of adjustment to the aging process. Some studies have combined elements from both components when examining successful aging." Theoretically, Rowe and Kahn[2,3] differentiated "successful aging" from "usual aging". Their definition of successful aging described elderly individuals who have a low level of disease or disability, a high cognitive and physical functioning capacity, and an active engagement with life.

Measures of functional status have been widely used in clinical studies of successful aging. Historically, the primary focus has been functional health status, economic issues, and family support issues[4,5] Also, a major focus in aging research is to discover the causal relationship between psychological (or subjective) well being and health status.[6,7] Since psychological well being is a subjective term, many different definitions and measurement tools have been designed to assess subjective well-being. Generally speaking, well-being means feeling good, or having good mental health; it is a personal evaluation based on how the respondent feels, not an evaluation based on external criteria such as visits to mental hospitals or psychologists' clinical evaluations. However, research has found, for the elderly, physical and/or mental health outcome is strongly linked to one's psychological well being.[8] Also, research has consistently demonstrated that individuals in poor health are less satisfied with their lives than those in good health.[9] In addition, health has also been found to influence people's projection with future life satisfaction and their changes in life satisfaction over time.[10,11]

Quality of life (QOL) is another reliable evaluation concept in relation to older people's health and illness. QOL is defined as the combination of an individual's functional health, feelings of competence, independence in Activities of Daily Living (ADL)/Instrumental Activities of Daily Living (IADL), and satisfaction with one's social circumstances.[12] Ideally, the study of health status for the elderly should include both subjective and objective health outcome concepts. Perceived health status or self-reported health status is the subjective health outcome (or health problems) reported by the respondent. It is the best single predictor of life satisfaction for the older population since it is more strongly related to life satisfaction than other factors identified by researchers.[13,14] In addition, researchers have found that objective evaluated health status information provided by physicians can serve as a cross-validation source to ensure the reliability of the subjective health information offered by their patients.[13,15]

There are several measurements available for measuring functional health status of seniors. Older American Resources and Services—Multidimensional Functional Assessment Questionnaire;[16] ADL and IADL; Short Form 36 items health survey (SF-36) and Short Form 12 items health survey (SF-12); the Mini Mental State Examination (MMSE), the Life Satisfaction Index A (LSIA); Cognitive Performance Scale (CPS); Health Utilities Index—mark 2 (HUI2); Shanghai Successful Aging Project Questionnaire;[17] the Brief Risk Identification of Geriatric Health Tool (BRIGHT) questionnaire;[18] and Minimum Data Set for Home Care (MDS-HC).[19] The first two scales rely heavily on a doctor's accurate diagnosis and a patient's honest disclosure of his/her health conditions. As to the latter two scales (i.e. ADL/IASL and SFU12/36), they are more suitable for older people living in aggregate compound.[20] The MHS-HC is another assessment tool designed for community dwelling seniors. Although Chi[21] concluded that the function of MDS-HC in case finding or screening is limited for Hong Kong primary medical care setting, in this study, MDS-HC is chosen due to its comprehensiveness in geriatric assessment.

In Taiwan, the percentage of people over age 65 in 2008 was 10.4% (DGBAS, Bureau of Statistics, 2009). Statistically, the growth rate of this population will accelerate to a level of 3.0% annually from 2020–2025.[22] The growing of the aging population

will require equivalent increase in health care services. The National Health Insurance in Taiwan was implemented in 1995. As in other developed countries, such as the National Health Service in England, Medicare/Medicaid in the United States, and the Medical Services Plan (MSP) of Canada, all provide programs or implement policies to assist their senior citizens to cope with health related issues. According to findings of 2005 Taiwanese National Census,[23] 33.4% of the population over age 65 rated their health "excellent" subjectively; however, a responsive health services for the years to come maybe necessary for the expected growing aging population.

Methods
Participants and setting
Study participants were randomly selected from southern Taiwan by using a two-stage strata (urban/rural and Lin/Lee) sampling method. A roster of the elderly aged 65 and over was provided by the Ministry of Household Registry. Participants were randomly selected for interview. Face-to-face trained interviewers (n = 12) for this project were professional nurses who were required to attend three MDS-HC trainer's sessions before the actual data collection. The training procedure was to ensure international standardized MDS-HC required by the interRAI Group. Data collection period lasted for 3 months. On average, the length of each individual interview was 40 minutes.

Study sample size and response rate
Based on 95% confidence level, the intended design for sample size was 520; however, after field data collection, 405 completed the questionnaire. Of the 405 questionnaires, 3 of them were determined by the research team as invalid for further analysis. The final response rate for the project was 78%.

Research Procedure
Step 1: Obtained study approval from a local university Research Ethics Review Committee.

Step 2: Identified study population and selected research participants.

Step 3: Standardized MDS-HC training sessions for 12 interviewers before data collection.

Step 4: Questionnaire translation and validation. Minimum Data Set for Home Care (MDS-HC) measurement questionnaire was translated forward and then backward into Chinese version by 3/3 bi-lingual Social Science/Social Work professionals to test its cultural adaptability and compatibility with Taiwanese senior population.

Step 5: Collected consent forms from all participating individuals. Instrument testing with 10 pre-test field interviews. Pre-test interviews were conducted after Step 2 was completed to discover the needs for necessary questionnaire modification.

Step 6: Data Collection.

Step 7: Statistical Analysis. The current research involved uni-variate and bi-variate analytical procedures.

Research Instruments
The MDS-HC questionnaire was chosen as the instrument for the study due to its comprehensiveness in functional health assessment and its capability in finding unmet needs in community-dwelling seniors. The MDS-HC assessment items included measures in the following areas: personal information, cognitive patterns; communication/hearing; vision; mood and behavior patterns; social functioning; informal support services; physical functioning; continence; disease diagnoses; health conditions and preventive health measures; nutrition/hydration status; dental status; skin condition; environmental assessment; service utilization; and medication information. Assessors for MDS-HC are required to have professional medical/nursing training and practice.

It was designed by interRAI Group as a standardized geriatric assessment tool used by international collaborators and researchers.[24,25] It is designed to be administered by trained assessors to ensure its effectiveness and accuracy. In the United States, it is one of the tools accredited by the Department of Health. The instrument covers contact information, overview of comprehensive assessments. Repetitive use of the instrument can detect participants service needs change over time.

The instrument also offers 30 different Client Assessment Protocols (CAPs) which can be 'triggered' as part of the assessment process. The CAPs refer to areas of concern which may require further investigation, internal/external referral and consideration as part of the individual's care plan. In sum, the collection of CAPs information is to support professional judgment. Together, there are 3 major categories in

CAPs: (1) Functional Performance; (2) Sensory Performance; and (3) Mental Health. Three CAPs categories and their subsequent measurement areas are listed in Table 1.

The Version 2.0 MDS-HC instrument was translated from the English to Chinese using backward and forward methods[26] to verify the accuracy of the translation process. Three bi-lingual (Chinese and English) Social Science professionals provided the forward translation. A final forwarded translation was finalized when the team reached their consensus with discrepancies occurred in the translation process. Another 3 Social Work professionals then translated the Chinese version back to English. Final comparisons were made between the translated version and the original version to determine the accuracy of the Chinese version.

Data Processing and Statistical Analysis

Functional health status data is presented to support the purpose of the study. Analyses of participants' demographic background, current and potential health problems, and CAPs calculations are conducted to determine the health needs of the participants.

Descriptive and univariate analyses were used to determine the status of older adults participated in the study. Characteristics of respondents were presented

according to the coding system in the questionnaire. Data were re-grouped into "low severity", "medium severity", and "high severity" to differentiate the health needs of the participants. All statistical analyses were performed using SPSS statistical software, version 15.

Results
Distributions of participants' characteristics

Table 2 shows the background characteristics of the respondents. The mean age of the respondents was 71.5 years old with standard deviation [SD] of 5.3 years. Among the participants, 55.5% were male; 71.9% were married; 36.3% had elementary level formal education and 36.3% had no education, and 21.6% had a secondary school or higher education. Although Mandarin is the official language of Taiwan; Taiwanese dialect was the language spoken at home for most of the 65.4% respondents. For 90.0% of the participants living at home, they did not need formal care services for their daily routines. For living arrangement, those who living at home, 46.8% were living with spouse and others (non-children); however, 49.0% of the participants received their source of income from their children no matter what was their living arrangement. As to taking medication in the past 7 days, 47.3% of them were medication free.

Table 1. Three CAPs categories and their subsequent measurement areas.

(1) Functional performance	(2) Sensory performance	(3) Mental health
ADL rehabilitation potential	Communication disorders	Alcohol abuse
Instrumental activities of daily living	Visual function	Cognition
Health promotion	Continence	Behavior
Instructional risk	Bowel movement	Depression and anxiety
Health problems	Urinary incontinence and indwelling catheter	Elder abuse
Cardio respiratory		Social function service oversight
Dehydration		Compliance with treatment
Falls		Risk of breakdown of informal support
Nutrition		Medication management
Oral health		Palliative care
Pain		Immunization and screening
Pressure ulcers		Psychotropic drugs
Skin and foot problems		Reduction in formal services possible
		Environment assessment

Table 2. Distributions of participants' characteristics.

Variables	N (%)	Mean/ median (SD)
Age group	402 (100.0)	71.5 (5.3)
65–74	304 (75.6)	
75–84	88 (21.9)	
85 and over	10 (2.5)	
Gender	400 (100.0)	1 (0.5)
Male	222 (55.5)	
Female	178 (44.5)	
Marital status	402 (100.0)	2 (0.5)
Never married	6 (1.5)	
Married	289 (71.9)	
Widowed	101 (25.1)	
Other	6(1.5)	
Language spoken at home	402 (100.0)	2 (0.6)
Mandarin	71 (17.7)	
Taiwanese	263 (65.4)	
Haka	67 (16.7)	
Other	1 (0.2)	
Education	402 (100.0)	3 (1.4)
Literate	146 (36.3)	
Literate (self-taught)	20 (5.0)	
Elementary school	149 (37.1)	
Junior high school	33 (8.2)	
Senior high school	45 (11.2)	
College and above	9 (2.2)	
Physical assistance	402 (100.0)	1 (0.6)
Home(no aide)	362 (90.0)	
Home with aide	31 (7.7)	
Retirement apt	3 (0.7)	
Other	6 (1.5)	
Living arrangement	402(100.0)	3 (0.9)
Home (alone)	31 (7.7)	
Home with spouse only	90 (22.4)	
Home (spouse and others)	188 (46.8)	
Home with children	86 (21.4)	
Home with non-children	6 (1.5)	
Other	1 (0.2)	
Major source of income	402 (100.0)	7 (2.7)
From self	40 (10.0)	
From pension	64 (15.9)	
From spouse	10 (2.5)	
From rental	4 (1.0)	
From investment	2 (0.5)	
From savings	14 (3.5)	
From children's support	197 (49.0)	
From social assistance	62 (15.4)	
Other	9 (2.2)	
Medical history (Refers to receiving medical services 5 years prior to referral)	402 (100.0)	
Yes	212 (52.7)	2 (1.8)
No	190 (47.3)	

Overall, 82% of the respondents reported their health as positive and healthy.

Health status of the elderly in Taiwan

Information of the health status of the elderly in Taiwan is summarized in Table 3. In Table 3, 16 health conditions are listed based on their level of severity. Each health condition is classified into 3 levels: low severity, medium severity, high severity. The classification is to differentiate participants' health needs. The lower the severity level is, the lesser the immediate health need is. Percentages in "medium severity" indicate areas of health needs: "vision" (29.1%), "social functioning" (19.9%), "informal supports" (27.2%), "dental" (98.0%), and "environmental risks" (15.7%). When re-arranging the percentages, the top health need is for "dental" services, followed by "vision" services, "informal supports" services, "social functioning", and "environmental risks" prevention services. As to other listed health conditions, percentages in Table 3 show minimum health needs from the participants. Problems triggered by CAPs calculation will be discussed in Chart I and Chart II.

Table 3. Health status of the elderly in Taiwan.

Health status (range)	Low severity (%)*	Medium severity (%)*	High severity (%)*
Cognitive (0–6)	89.8	8.4	1.7
Communication/hearing (0–9)	88.3	9.9	1.7
Vision (0–6)	70.7	29.1	0.2
Mood and behavior (0–3)	98.0	1.4	0.4
Social functioning (0–8)	77.2	19.9	2.9
Informal supports (4–25)	72.8	27.2	0.0
IADL (0–21)	91.0	9.0	0.0
ADL (1–41)	96.9	2.5	0.0
Continence (1–10)	91.8	8.0	0.2
Potential health risks (4–26)	100.0	0.0	0.0
Nutrition/hydration (0–8)	97.3	2.5	0.2
Dental (0–2)	0.2	98.0	1.7
Skin condition (0–16)	95.8	3.2	1.0
Environmental risks (0–5)	82.6	15.7	1.7
Formal service utilization (0–4)	97.0	2.0	1.0
# of medications (0–4)	100.0	0.0	0.0

Note: *Some numbers do not add up to 100.0 due to the calculation accuracy to 2nd fractional digits, i.e. 0.00 in the original formula.
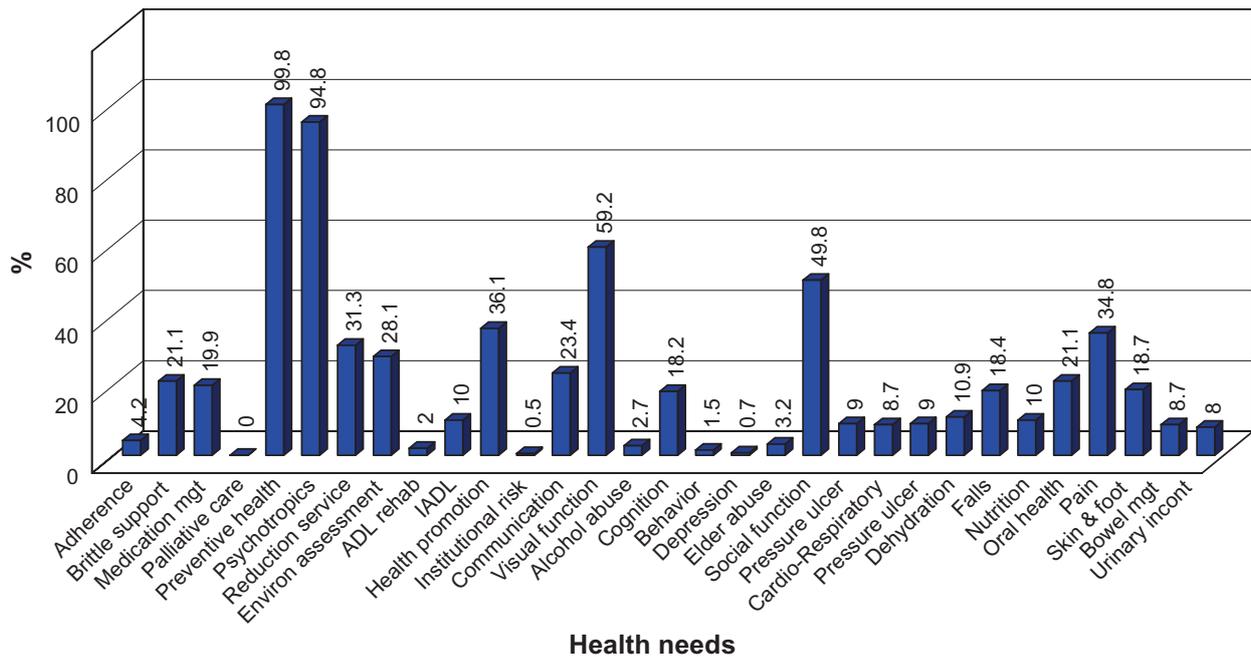
Chart I. Percentage distribution of cap triggered potential health needs.
Note: ADL stands for "Activity of Daily Living"; Environ Assessment stands for "Environmental Assessment".

Client Assessment Protocol (CAP) triggered health needs

Further analysis using CAPs calculation method, 31 health related issues were included in the formula for the purpose of finding participants' potential health needs. In Chart I, the results show us percentages of CAPs triggered health conditions ranged from 99.8% to 0.0%. The higher the percentage is, the more urgent of their health need is in that specific health condition. The top 10 CAPs triggered potential health conditions as follows: 99.8% of preventive health (i.e. 99.8% of the respondents are in need of preventive health), followed by 94.8% of potential psychotropic problems (i.e. depression and dementia related issues), 59.2% of vision care, 49.8% of social functions, 36.1% of health promotion, 34.8% of pain management, 31.1% service reduction, 28.1% of environment assessment, 23.4% of potential communication problem, and 21.1% of potential brittle support.

The total number of potential health needs of surveyed participants identified by CAPs is shown in Chart II. The higher the total number is, the more health issues the participants have. The range of the total number of health needs in Chart II is from 1 to 19. The result indicates 13.4% of participants have four CAP triggered potential health issues; followed by 12.4%

of three potential health issues; 12.2% of two potential problems; 10.4% of six health problems; and 10.0% of seven health problems identified. The majority of the participants have total number of health needs of four or less than four potential health problems identified.

Discussion and Policy Implication

The primary objective of the study is to unveil the functional health status of the elderly in Taiwan. All together, 402 randomly selected senior participants were interviewed and assessed for the study. The author's rationale is that the current study may be used for policy planning, implementation, and service enhancement purposes.

Researchers and practitioners in Taiwan have been requesting a system of effective service delivery; however, provision of senior services is still in initiatives stage. This situation could have been caused by lacking baseline health status data, therefore, having information available for policy makers is critical.

For mature adults, a higher level of functional health status indicates their successful aging process. It is a combination of physical, psychological, and social conditions.[1] In addition, the status reflects a combination of measurable indicators that reflect all levels of their daily functioning. The tool used in the
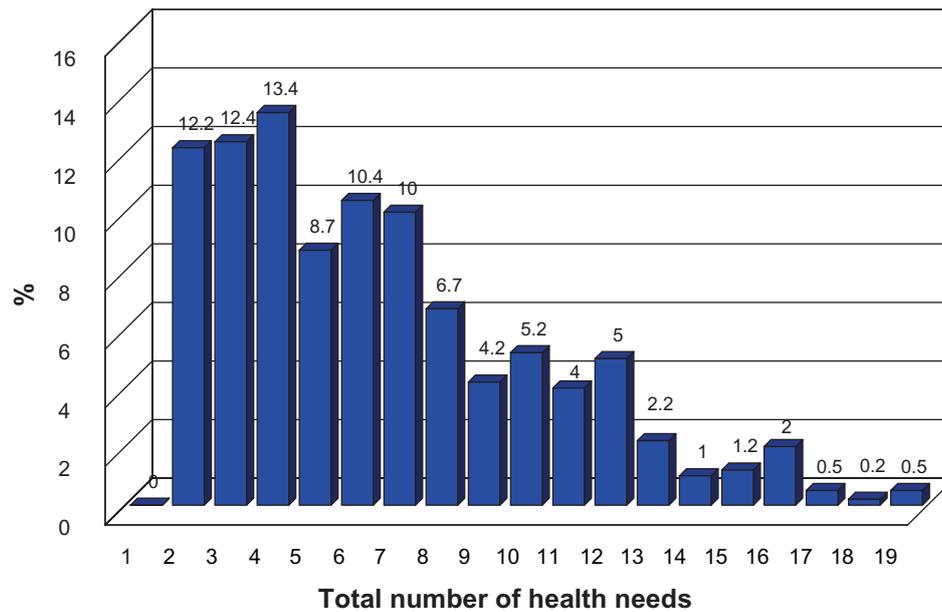
Chart II. Percentage distribution of total number of cap triggered health needs.

current study is MDS-HC to measure the participants' cognition, communication/hearing, vision, mood and behavior, social functioning, IADL/ADL, nutrition, dental, skin, health risks, formal and informal service needs, and medication intake.

The results of this study reveal that there is a gap between subjective (self-reported) health status and objective (MDS-HC assessment tool) health status of the participants.

1. In the study, 82% of the respondents' subjectively reported their health status as positive and healthy.
2. Objective health status of the participants measured by MDS assessment tool indicates their needs in the following: vision care, social functioning, informal support, dental, and at risk of environmental hazards at home. As to the total number of potential health needs triggered by CAP, the majority of the participants have a total number of four or less than four identified potential health needs.

Which health status rating is a more accurate representation of the true state of the elderly in Taiwan? Although longitudinal studies are recommended for the future to uncover details of the gap in between objective and subjective health status, the literature suggests measurement preferences, cultural norm factors, participants' lacking exposure to accessible and available services, and little health prevention education offered to seniors in Taiwan may play a key role in the findings.

Based on Dollinger and Malmquist,[27] an ideal functional health status measurement needs to a measurement consists of both subjective and objective measures. Although in their study, objective evaluations were more reliable than subjective evaluations, subjective ratings were necessary for purpose of comparison. Sievers[28] indicates patients' symptoms and perceived health is in part an independent construct, not merely reflecting their objective measures. Subjective measures should therefore be regularly documented in patients as a patient-oriented indicator for treatment success.

Cultural norms and ethnicity may be a contributing factor to the gap. There is limited research on Asian seniors and preventive medicine in the literature; however, researchers found evidence to support its unpopularity in the culture.[29–31] Reasons for its unpopularity include cultural (aging is a normal process) and medical linguistic factors (i.e. medical terminologies), a lack of knowledge about preventive tests, feelings of embarrassment during medical tests, and the low priority of health screening when comparing with other commitments.

Furthermore, the author examined issues related to representativeness of participants in the current research. Study participants were selected randomly in the southern region of Taiwan based on two stage

Table 4. Age distribution comparison between total population and current study.

Age category	65–74	75–84	85 and above	Total
Total population	60.3%	33.1%	6.6%	100.0%
Current study	75.6%	21.9%	2.5%	100.0%
Differences	(+)15.3%	(–)11.2%	(–) 4.1%	

Source: Bureau of Statistics, Ministry of Interior Affairs, Taiwan, ROC, 2006.

strata sampling method; however, can one generalize the findings to the entire Taiwanese elderly population? Information in Table 4 examines and compares the distribution of the two populations. For all age groups, the range for differences are between (–)4.1% and (+)15.3%, indicating over-representation of age group 65–74 by 15.3%, under-representation of age group 75–84 by 11.2%, and under-representation by 4.1% of the 85 and above age group. Although the differences are not statistically significant (2-tailed t-test: 0.07; 0.12; 0.27), the generalizability principal of the findings should be applied with caution.

As to the mental health issues discovered in Chart 1, it could be embedded in the cultural heritage of the population. In traditional Taiwanese/Chinese culture, the social norms usually do not support verbal expression of explicit needs. Direct communication of personal desires is not part of the traditional internalization and socialization processes for Taiwanese seniors. Instead, Taiwanese elders tend to exhibit psychosomatic symptoms such as stomach pains and headaches during time of their physical as well as mental health problems. If caregivers or family members are less sensitive to the symptoms and treat them as "normal aging process", the possibility of early detection and treatment is low. The finding suggests public education on prevention and early treatment maybe a top priority service for Taiwanese seniors.

In conclusion, findings from this study support specific preventive and daily functioning services needed to be made available to community-dwelling seniors in Taiwan. By doing so, it would increase both subjective and objective health status of the elderly population and consequently would lead to their quality of life in the community as well.

Disclosure

This manuscript has been read and approved by the author. This paper is unique and is not under consideration by any other publication and has not been published elsewhere. The author and peer reviewers of this paper report no conflicts of interest. The author confirms that they have permission to reproduce any copyrighted material.

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