Review Article

Addressing nutritional requirements of ageing consumers in Asia—recommendations from an expert workshop

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The number of older persons in Asia is expected to triple by 2050. Ageing is associated with non-communicable chronic diseases, malnutrition, and geriatric syndromes, which influences the burden on the cost related to healthcare, health outcomes, and the quality of life. Experts in the field of older adult nutrition from Asia, Australia, and Europe were invited to participate in a two-day workshop to review the available data, current policies and programs for the ageing population in different countries of Asia to identify the gaps in knowledge and to develop recommendations for action. In Asia, most of the data pertaining to health status, nutritional status, and nutrient intake of the older persons were mainly obtained by conducting studies in nursing homes or hospitals and small cohort studies. There were limited country-specific data on this population. Moreover, the available data pertaining to different countries were difficult to compare due to differences in the reporting format and reference values used. Although nutrition initiatives and policies were realized and public education was conducted to support the older persons, most of these efforts targeted the general population rather than the older persons population segment. In healthcare management, a higher amount of education is required pertaining to the knowledge of nutritional requirements and appropriate feeding of the older persons to reduce underfeeding and its consequences. The expert group recommended the use of a systematic approach for reviewing data pertaining to different countries, initiatives, and programs to further evaluate the available data to underpin future research.

Key Words: healthy ageing, malnutrition, frailty, nutrient intake, nutritional status

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INTRODUCTION

The world's population is ageing. Asia is one of the continents undergoing rapid demographic transition with an increase in the number of older persons, which is expected to triple by the year 2050 for the category of 80 years or above and to double for the category of 60 years or above since 2015.[1] According to the United Nations report on the world ageing population, from 2015 to 2030 Asian countries such as China, Hong Kong, Vietnam, Malaysia, Singapore, and Indonesia would attain a higher ranking of the most aged population based on the projected percentage.[1]

Ageing is accompanied with a decline in functional ability and health. Thus, lifestyle and diet clearly play a crucial role in ageing.[2] This trend has been particularly evident in more economically developed Asian countries in which migration from rural to urban areas is accompanied by a change in lifestyle and dietary habits.[3-6] These trends have a significant impact on health, in view of the shift from primarily infectious diseases to non-communicable chronic diseases (NCDs) including hypertension, diabetes, cardiovascular or cerebrovascular disease, cancer, osteoporosis, and cognitive decline.[7,8] Such a shift in the type of diseases coupled with the ageing of the population increases the burden on healthcare resources.[1,2] Diet is one of the modifiable factors which may help to prevent health problems and improve quality of life (QoL) later in life.

Both increasing longevity and declining fertility contribute to population ageing in Asian countries.[1,9-11] Thus, the older adults will have fewer adult children to support them in the coming years. Furthermore, due to the changing social and economic environments, fewer older persons in Asia will live with their extended families.[8] Therefore, many older people in Asia with increasing physical health needs will have to care for themselves. In this case, any physical health concern can be exacerbated by psychological, economic, and nutritional deprivations.

The shift in the population structure and ageing has enormous implications for governments (in policy and healthcare system development), families, and older people themselves. Thus, to respond to these concerns and promote healthy ageing, knowledge of trends in demography, family structure, social support and healthcare is required to encourage favourable outcomes for older persons and their communities. This would be in line with the global strategy and action plan of WHO on ageing and health. One of the strategic objectives is to improve data collection, subsequent monitoring, and research on healthy ageing.[11] Such information can serve as input for recommendations, planning, and policy making to support healthy ageing.

This strategy applies to the nutritional field, in which there is a need to gather available data on dietary intake and recommendations, risk factors for undernutrition, health status, nutrition-related health programs or initiatives, and policies for assessing the gaps and needs of the older persons. Hence, a two-day workshop 'Nutritional Needs of the Ageing Consumer in Asia' was organized in November 2016 with the objectives of reviewing available information on the nutritional and health status of the ageing population in six Asian countries, identifying data or information gaps, in order to formulate recommendations and instigate action to optimise nutritional and health status of older Asians.

METHODS

Experts from China, Hong Kong, Vietnam, Malaysia, Singapore, Indonesia, Taiwan, Australia, and the Netherlands were invited to provide and share country-specific data for the following:

- Identifying nutrition- and health-related problems pertaining to the older persons in each country.
- Identifying gaps in nutritional requirements and knowledge required.
- Proposing recommendations to fill the gaps and to conduct further research.

Data were then collected and discussed as a basis for informational gap remediation and policy development.

RESULTS AND DISCUSSION

Health and nutrition scenarios in the different countries

Table 1 presents the proportion of the population aged 60 years or above for different countries. This proportion is expected to be more than double from 2015 to 2050 for China, Hong Kong, Vietnam, Indonesia, Malaysia, and Singapore, with increasing life expectancy.[2,11-14]

This phenomenon of population ageing is a common concern for all Asian countries. This shift has many implications; one implication is the need to maintain a sustainable workforce. As the ratio of the young to older people declines, the service period of older employees will need to increase unless robotics supervene. Thus, a healthy and active yet ageing workforce will be sought. Much of the potential decline in function and the advent of NCDs such as hypertension, diabetes, cardiovascular

Table 1. Percentage of the population aged 60 or above and the life expectancy

	Percentage aged 60 or over†			Life expectancy (years)‡	
Year	2015	2030	2050	2000	2015
China	15.2	25.3	36.5	72.0	76.1
Hong Kong	21.7	33.6	40.9	80.8	83.8
Vietnam	10.3	17.5	27.9	73.3	76.1
Indonesia	8.2	13.2	19.2	66.3	69.0
Malaysia	9.2	14.4	23.6	72,8	75.1
Singapore	17.9	30.7	40.4	78.3	82.8

†World Population Ageing 2015.[1]
‡World Health Statistics 2016: Monitoring health for the SDGs Annex B: tables of health statistics by country, WHO region and globally.[13] https://ourworldindata.org/life-expectancy.

diseases (CVDs), osteoporosis, dementia and of neoplastic disease is nutrition-related. Table 2 presents the reported prevalence for these NCDs. Data pertaining to hypertension and diabetes was available for the six countries, but stroke-related data was available only for China, Hong Kong, and Indonesia. The prevalence of hypertension and diabetes was much higher compared to that of stroke. However, this may not be an ideal comparison because the data may be incomplete due to the limited availability of country-specific data. Fifty percent of the older persons in China experience NCDs.[24] In Malaysia, NCDs are the leading cause of mortality and account for 75% of total deaths.[22] The prevalence of NCDs increases with increasing life expectancy. NCD prevalence data helps to understand the health status in regard to morbidity and disability, which is needed to promote healthy ageing and QoL.

Information about dementia and osteoporosis is limited. In Indonesia and Malaysia, the estimated number of people with dementia amounted to 1,033,000 and 123,000 in 2015 with a projection to increase to 1,894,000 and 261,000 in 2030 and 3,979,000 and 590,00 in 2050, respectively.[25] In Singapore and Vietnam, the reported prevalence amounted to 10% (≥75 years old) in 2015[26] and to 58.3% (≥80 years old) in 2016,[25] respectively. The lack of reference standards for collecting or reporting the measurement compromises the comparability of these data. Similarly, the reporting format for osteoporosis differs between countries. In Hong Kong, osteoporosis was reported as the number per 100,000 with values up to 379/100,000 for women and 169/100,000 for men.[18] The prevalence of osteoporosis in Vietnam was reported as part of bone and joint diseases and had a value of 56.6%. This value corresponded to the people with age greater than or equal to 80 years old in 2016. Conversely, the prevalence of osteoporosis in Indonesia in women was reported to be 23% for the age group of 50–80 years and 53% for the age group of 70–80 years. In men, the prevalence was 6.3%, 8.3%, and 11.9% for the age groups of 50–80, 60–80, and 70–80 years. Osteoporosis prevalence was four times higher in Indonesian women than in men.[27]

Prevalence data on pre-frailty, frailty, and sarcopenia are presented in Table 3. These data could only be obtained from a few countries and not for all age groups, thus reflecting substantial data gaps. Frailty and sarcopenia appeared highly prevalent. They belong to geriatric syndromes. The severity of these syndromes increases with age, and the syndromes may lead to disability and death. The prevalence of frailty in Hong Kong increased from 5.1% for the older persons in the age group of 64–69 years to 16.8% for the older persons above 75 years.[33] In China, Shanghai has consolidated data on sarcopenia, for which the reported prevalence amounted to 13.2% for men and 4.8% for women over 70 years of age.[34]

For under- and overnutrition, the survival implications of the former are more adverse than those of the latter considering body composition criteria of older Asian populations.[35,36] Malnutrition, as judged by food intake quality, body composition and cardiometabolic criteria, is common among older adults, with various physical, social, economic and psychological determinants[37] including depression[38] which may lead to unintentional weight loss and poor nutritional status. A multidisciplinary approach to assess and manage the prevailing determinants of malnutrition is required.[39] In China, more than 53% of the older persons living in institutions were either malnourished or at nutritional risk. Here, the prevalence of anaemia among the older persons in the age group of 70 years and above was 19.5%–21%.[40] In Malaysia, the reported prevalence of overnutrition was 27%–39% among the people above 60 years old, whereas 3.7%–10.9% of the 75-year-old people were malnourished.[22] In Singapore, the prevalence of malnutrition using the Mini Nutritional Assessment (MNA) in community dwelling people aged greater than or equal to 65 years was 3.6%.[32] Co-occurrence of physical frailty and poor nutrition was stronger associated with a considerable increase in

Table 2. Prevalence of NCDs for different countries

Age		≥60	≥65	≥70	≥75	≥80
Hypertension	CH	66.9%	-	-	-	-
	HK	-	47.0%	-	-	-
	VN	-	-	-	-	57.1%
	IN	-	57.6%	-	63.8%	-
	MS	65.0%	67.8%	75.4%	73.4%	-
	SG	-	-	53.4%	-	-
Diabetes	CH	19.6%	-	-	-	-
	HK	-	18.0%	-	-	-
	VN	-	-	-	-	28.0%
	IN	-	4.8%	-	3.5%	-
	MS	38.3%	38.0%	39.1%	37.0%	-
	SG	-	-	29.1%	-	-
Stroke	CH	5.7%	-	-	-	-
	HK	-	4.0%	-	-	-
	VN	-	-	-	-	-
	IN	-	46.1mil	-	67mil	-
	MS	-	-	-	-	-
	SG	-	-	-	-	-

CN: China[15,16], HK: Hong Kong[17,18], VN: Vietnam[19], IN: Indonesia[20,21], MY: Malaysia[22], SG: Singapore.[23]
No data available indicated with '-' dash.

Table 3. Prevalence of pre-frailty, frailty, and sarcopenia

Age		≥60	≥65	≥70	≥75	≥80
Pre-frailty	CH	-	-	-	-	-
	HK	-	52.4%	-	-	-
	VN	-	-	-	-	12.8%
	IN	61.0%	-	-	-	-
	MS	55.6%	-	-	26.2%	-
	SG	-	50.4%	-	59.6%	-
Frailty	CH	-	-	-	-	-
	HK	-	12.5%	-	-	-
	VN	-	-	-	-	13.8%
	IN	25.1%	-	-	-	-
	MS	7.7%	-	-	34.2%	-
	SG	-	7%	-	13.8%	-
Sarcopenia	CH	-	-	F: 4.8% M: 12.3%	-	-
	HK	-	F: 1.3-18.3% M: 2.6-22.1%	-	-	-
	VN	-	-	-	-	-
	IN	15.8%	-	-	-	-
	MS	-	-	-	-	-
	SG	-	-	-	-	-

F: female; M: male
CN: China[24], HK: Hong Kong[17,18], VN: Vietnam[19], IN: Indonesia[28-30], MY: Malaysia[31], SG: Singapore.[32]
No data available indicated with '-' dash.

disability, poor QoL, and mortality over time than living alone was.[38,41] The prevalence of malnutrition increases with age in Malaysia and Singapore. Based on the data from the national survey conducted in 2013, the prevalence of undernutrition (BMI <18.5 kg/m^2) among Indonesian adults was 8.7%.[42] In an outpatient hospital setting, the prevalence of undernutrition based on MNA was 2.1% in Indonesia and the prevalence of those at risk of malnutrition was 56.7%.[28] In a community setting, the older persons in the rural areas of Indonesia presented a higher prevalence of malnutrition and a higher risk of malnutrition than those in the urban areas (6% vs. 3% and 73% vs. 44%, respectively). This difference in rural and urban could be due to lower levels of education and income in rural areas leading to less dietary intake.[29] The prevalence of BMI >25 kg/m^2 among the older persons in Indonesia in 2010 was 19.7% based on the National Basic Health Survey.[43] In the outpatient setting in Indonesia the prevalence was 22.51% for the people with a BMI of 23–24.9 kg/m^2 and 22.08% for those with a BMI of 25 kg/m^2 and higher.[28] Thus, besides undernutrition, overnutrition also seems to pose a concern in Indonesia and guidelines maybe needed to address both under- and overnutrition. In Vietnam, a high prevalence of malnutrition of 41% was observed, and micronutrient deficiencies including anaemia were observed for 48% of the older persons in the age group of 80 years and above. Moreover, data for the younger age categories were not available.[44-46] All these conditions might be interconnected and jointly result in an increase in the burden on healthcare provided to the older persons and the healthcare system. The consequences of the increased burden are an increase in the healthcare costs and length of hospital stay. For example, in Vietnam, the medical costs for the older persons is 7-10 times higher than those for young people.[44,45] By analysing the data collected on the prevalence of NCDs, geriatric syndromes, and nutritional status for the countries, it was obvious that the data were mainly collected by conducting small cohort studies or obtained from studies conducted in nursing homes or hospital settings. The national nutrition surveys from most countries were neither recent nor reported on all the nutrient intakes. There were even fewer studies on the health and nutritional status of older persons in community settings. Moreover, there was a higher amount of information on NCDs for the younger age groups (up to 75 years old) compared with that for the oldest age group (>75 years). Thus, the knowledge gaps to be filled may differ by nutritional status parameter, setting, and age category.

Nutrient intake, dietary habits, and ageing processes are interrelated and can influence healthy ageing. However, nutrient intake information was quite limited in many Asian countries and most often obtained from national surveys or small cohort studies conducted in institutions. In most of the Asian countries the Recommended Daily Intakes or Allowances (RDI or RDA) were derived from their national nutrition survey, from small scale surveys, and/or from household food consumption findings, following the framework of the Food and Nutrition Board of the Institute of Medicine aiming to meet the requirements of 97.5% of healthy individuals by life-stage and gender. In general, reported mean intake values were compared with the RNI/RDA. These reported values did not include proportions below estimated average recommendations (EAR), so these are not included in this review. Several countries are currently updating their reference values. Most of the countries acknowledge that these recommendations require updating. Thus, they are either updating their database or conducting more national dietary intake studies to establish new reference standards, especially for older adults. As this is work in progress the available recommendations (RDI or RDA) from Hong Kong, China, and Singapore originate from 2000, 2003, 2012, and 2010, respectively, including the older or more recent evidence.

Table 4. Key initiatives of each country

Countries	Key Initiatives
China[15,24,40,59,60]	• Healthy China 2030 initiative • National nutrition plan (13 actions with 1 focus on older persons) • Dietary guidelines • Guideline of Food and Nutrition Development in China, 2015-2020 • National nutrition week
Hong Kong[33,61]	• Cadenza Hub for Frailty • Healthy Ageing through Empowerment Programme • Senior Eat Smart • Cook Healthy Programme • eHealth Programme • Lifestyle Modification Programme
Malaysia[22,62,63]	• National Plan of Action for Nutrition of Malaysia (NPANM) • Be Healthy for Life • Nutrition Month Malaysia Carnival (i.e. healthy community kitchen, Malaysia vegetarian cooking competition, calorie awareness campaign) • MyNutri Diary Apps • Malaysian Dietary Guidelines for Older Person • National Research Institute on Ageing
Singapore[32,38,64-66]	• Action Plan for Successful Ageing • Consolidation of government social and health aged care under Ministry of Health • Pioneer Generation Package and Pioneer/Silver Generation Office • Longitudinal and Interventional Ageing related Studies
Vietnam[44–46,67–69]	• Older persons Law • National Commission on NCT • National Action Program on Ageing • National Nutrition Plan
Indonesia[70-72]	• Indonesian Frailty, Ageing, and Quality of Life (INA-FRAGILE) Longitudinal Study • National action plan on healthy ageing • National policy on geriatric healthcare in hospital setting

As the recommended daily intake are work in progress, this could result in disparities in terms of references used, such differences may hinder the comparison of population means as related to the countries' norms, as reported. In China, based on the national survey of 2010–2012, the average protein intake of the older persons was 53–62 g/day for men and 43–55 g/day for women. However, the recommended nutrient intake (RNI) was 65 g/day for men and 55 g/day for women.[40] The mean intakes of many micronutrients were lower than the recommended amounts, in particular, for vitamin B2 and calcium. The intake of fruit (16–59 g/day), poultry (7–12 g/day), fish (12–31.6 g/day), milk (8–48.5 g/day), and soy products (10–18 g/day) was much lower than the amount recommended by the dietary guidelines.[40] Studies have revealed that the older persons population in Indonesia who lived in the metropolitan and non-metropolitan cities had lower macronutrient and micronutrient intake compared with the national recommendation.[47–50] A study in non-metropolitan Padang revealed that compared with the older persons in the metropolitan area, the local older persons had a higher intake of carbohydrates and a lower intake of proteins and fats.[47] The Nutrient and Metabolic Study of Indonesian older persons on the eating patterns and food and energy intake reported that the older persons in Indonesia had inadequate food and energy intake, especially in the non-metropolitan area.[50] They reported that the intake of coconut milk[51,52] and oils, which were traditionally used to stir-fry vegetables and enhance flavour of Indonesian foods, was significantly higher among the older persons in the metropolitan area. Furthermore, the calcium, vitamin D, and protein intake of the older persons in Indonesia in institutionalized care settings were lower compared with the RDA (calcium 239.9 vs 1000 mg/day, vitamin D 0.6 vs 400 IU/day, and protein 33.9 vs 60 g/day).[53] In the outpatient setting, the mean intake of calcium, vitamin E, and other micronutrients of the older persons in Indonesia were mostly 50%–70% lower than the RDA.[54] In Vietnam, data from the National General Nutrition Survey of 2009–2010 presented that the prevalence of chronic energy deficiency was approximately 26.6% for 60 years.[44] Although food intake and individual nutrient intake data were collected in each country the parameters reported were different in type and format, which poses a challenge to evaluate nutrient adequacy and to assess diet quality. Furthermore, population differences hinder comparisons across countries, e.g. the intake of calcium and vitamin D were mainly obtained from institutionalized older adults and in outpatient settings in Indonesia while this information was obtained from the National Survey in China. Despite similarities in age grouping the health level is clearly different between the populations studied.

Based on the obtained information, it is difficult to compare the dietary data because of different reporting formats, use of different assessment methods, and different cut-offs and reference points. All these factors contribute to the challenges in assessing and drawing an optimal conclusion. Moreover, there were limited data on nutrient intake and nutritional status of the age group of above 60 years, especially at the community level. Poor dietary habits and low food intake may lead to inadequate nutrient intakes that could influence the nutritional status, affect morbidity, disability, and QoL. As people grow

older, the above mentioned information becomes crucial input for each country to design innovative policies, public services, and healthcare for supporting the requirements of the older persons. This information is also useful in designing food supply systems or initiatives through financial assistance e.g. food stamps with defined use, or through joint efforts with industry in developing nutrient dense food products to specifically address poor food intake. Hereby early nutritional education and creating awareness will add to prevention of NCDs to build a healthy ageing population. Therefore, gathering more data with specific goals and updated information on food intake, food habits, nutrient intake, and their relationships with health outcomes is an immediate requirement. Projects on older persons nutrition such as SENECA[55] and Nu-AGE[56] in Europe, NHANES in USA, and NAHSIT57 in Taiwan are examples of successful data collection. These data helped to identify the key areas of concern and provided directions in developing healthy diet guidelines, food-based strategies and monitoring tools for different older population segments. For example, the Healthy Aging Nutrition Index (HANI) is an example of a simple, non-invasive, and inexpensive tool for predicting all-cause mortality in free-living older persons. HANI is a useful and easy-to-use tool to help older adults monitor and modify their diets and related personal behaviours. HANI presents the importance of merging data and technology to support diet and behavioural modification, while making data collection more manageable for monitoring and surveillance.[58]

National initiatives, policy, and healthcare systems

Policy and healthcare challenges faced by each country differ; thus, each country developed its own key initiatives as outlined in Table 4. The various initiatives in the six Asian countries aim to promote knowledge on proper nutrition and healthy lifestyles either at the community or national level. At the national level, the government of China has established several programmes for older persons including 'Healthy China 2030' initiative to promote QoL and prolong life expectancy. This initiative aims to promote a healthy lifestyle, optimise health-related services, improve health security, provide a healthy environment, and develop health care industries.[59] Another initiative is the 'Guideline of Food and Nutrition Development in China, 2014–2020' to improve the quantity and quality of food, and the overall nutritional status of the population.[60] These initiatives were disseminated to relevant offices within the government to promote public health education. In Hong Kong, most of the initiatives target the community. Two of them were the Cadenza Hub Frailty intervention programme and the lifestyle modification programme.[61] The programmes aim to provide a higher amount of knowledge and skills to the older persons as they age, thereby increasing self-awareness of their health status, facilitating better mental well-being, and increasing social interactions at the community level. In Malaysia, most of the initiatives and programs focus on the general population. Optimistically, the publication of the currently being developed 'Malaysian Dietary Guidelines for Older Person' will ensure that the standard messages on nutrition are disseminated to this target group. Singapore introduced a number of policies and initiatives to support the ageing population (Table 4) which provided additional relieves for medical and social aspects of the older persons. Most of these mentioned were successfully implemented but the outcomes require over time assessment and validation especially for those running at the moment. Notably, the outreach programmes targeted at the community could be assessed through participation rate and receptiveness of the community.

In Vietnam, the 'Older persons Law, National Action Program on Ageing and National Nutrition Plan' are enacted to protect the older persons. Although these regulations are validated to support the ageing population, they could not be used to develop more community-based initiatives for promoting awareness among the population. Indonesia, like Singapore, has conducted longitudinal health and ageing studies. The results of the studies such as the Indonesian Frailty, Ageing, and QoL Longitudinal Study; Singapore Longitudinal Ageing Studies; and Singapore Frailty Intervention Trial are envisaged to provide more insights concerning the older persons population in these countries. These insights would aid in formulating national action plans, strategies, and policies including community initiatives.

Most initiatives and programs in the different countries were developed to address the general population rather than specifically addressing the older adults except for Hong Kong and Vietnam where a few of these programs or regulations were specifically for older people. A lack of older persons-specific initiatives and programmes including nutrition recommendations or guidelines still exist for most countries. More importantly, the sharing of initiative and programme information including the implementation experiences, processes, and results would be helpful for the countries who would like to consider some of these initiatives and programs in their own country. The groups in the workshop agreed that besides policy and regulation, it is crucial to perceive how healthy ageing can be achieved both conceptually and in practice. Another point to consider while designing and developing initiatives and programs is to pay attention beyond the management of single NCDs and to consider the effect of multi-morbidities, geriatric syndromes, and nutritional requirements on health outcomes. This aspect is even more crucial for older persons with frailty, chronic diseases, and NCDs, conditions which should not be considered individually.[38] Nutrition should be part of the programme or initiative to attain a better health outcome. For example, an improved diet could lead to lower mortality;[73-76] intake of 20 μg (800 IU) of vitamin D per day can lead to a 20%–28% decrease in fractures and falls if the recommended intake is met;[77] or an increase in protein intake (>25 g/meal) with resistance exercise twice per week increases lean muscle mass.[78] Hence, a healthful dietary pattern and nutrition education should be incorporated in programmes and initiatives to ensure adequate nutrient intake that is combined with optimal lifestyle habits such as physical activity. These elements are the key to preventing diseases and improving health outcomes.

Besides the initiatives and programmes enacted in each country that are presented in Table 4, the healthcare system that is an integral part of care for the older persons often still lacks a holistic and comprehensive approach. For example, the awareness and importance of screening and functional assessment are often not sufficiently emphasized in the healthcare environment and at both institution and community levels to identify the older person who is at risk. In many countries, lack of financial support and manpower leads to a shortage in the facilities for providing long-term palliative care and training for healthcare service providers. This increases the burden on the family and causes the older persons to be exposed to a risk of higher morbidity and mortality. The limited number of healthcare service providers is also not adequately trained with skills and nutrition knowledge to care for the older persons. The lack of nutritional knowledge and awareness of the consequences of not providing sufficient nutrition causes the healthcare service providers to provide inadequate food. This becomes a more critical problem when the patients do not want to eat or are unable to eat due to the underlying medical condition or their psychology. The inadequate feeding increases the risk of malnutrition and the requirement of oral nutrition supplementation. The latter will increase the financial burden on the family and require long-term care facilities or hospitals. Thus, the knowledge of the healthcare services providers on nutrition including appropriate lifestyle for the older persons, especially those with chronic or geriatric syndromes, should be increased to optimize healthcare and the overall well-being. The relatively shortage of the health service providers in these countries needs to be addressed by an integrated approach from the government to educational institutes to provide adequate and trained health care professionals to support healthy ageing and improve the nutritional status and health of older people.

Conclusions and recommendations

The number of older adults is increasing in Asian countries and the proportion will become higher than that of young adults. Healthy ageing and overall well-being are pivotal to realising better QoL, sustaining the country's workforce, and limiting the burden on healthcare. Ageing is often accompanied with NCDs, and co-morbidity and malnutrition pose further complexities in older adults while optimising health outcomes and care recommendation. The expert-group recognized that for achieving better health outcomes, it is crucial to consider the effect of multi-morbidities, geriatric syndromes, and nutritional requirements on health outcomes rather than focusing on the management of a single NCD. For providing appropriate recommendations, comparable data on nutrition and health are required. There are challenges in obtaining country-specific data related to nutrition and health, which are infrequent and/or sparse to date. Most of the data, especially pertaining to older adults, were obtained by conducting small cohort studies and limited due to the community level setting. These data pose significant disparity and comparability problems across countries. There are also substantial data gaps in the population distributions in terms of the age, such as there is a higher amount of data pertaining to NCDs for the age group from 60 to 75 years and pertaining to malnutrition for people older than 75 years. Moreover, data could only be obtained from a few countries, and not all age groups were reflected. Information on the recommended daily intakes or allowances (RDI or RDA) and nutrient intake in most countries, especially for the older adults, should be updated. In general, most of the data reviewed during the workshop were presented in different reporting formats and used different cut-offs or different points of references. These differences posed challenges in comparing the data of different countries and in providing recommendations. Thus, an aggregated and collaborative effort is required to collect comparable data, align the reporting format, and develop the reference points and cut-offs. In healthcare management, the lack of resources and nutrition knowledge among the health services providers hinders the delivery of optimal care to the older adults. Thus, there is a need to focus on training the healthcare service providers to have sufficient knowledge and practical application experience of nutrition to improve the nutritional and health status of the older persons, especially the older and frail groups. Information on dietary and nutrient intakes, nutrition related health issues are relatively lacking in Asia, especially for community dwelling older persons. Thus, having comparable data would enable proper evaluations and recommendations for updating and enhancing current dietary guidelines for healthy ageing.

As a start, Asian countries should overcome the barriers pertaining to the availability of in-depth health and nutrition data of older people. First, a systematic approach should be formed to review the data obtained from different countries focusing on the nutrition-related aspects of healthy ageing to understand the data and knowledge gaps in each country. Moreover, this strategy should be implemented to learn the optimal practices, develop successful models for enhancing health literacy, and develop community care models by learning from each other.

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AUTHOR DISCLOSURES

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