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# Public Views towards Lifespan, Healthspan, and Healthy Longevity Medicine in Singapore: A Qualitative Study from the Healthy Longevity (HELO) Initiatives

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**Keywords**
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**Abstract**
***Introduction:*** Healthy Longevity Medicine (HLM) offers a strategy to reduce the healthspan-lifespan gap, yet public perspectives remain unclear. This study refines the Healthy Longevity (HELO) framework through a qualitative exploration of public views towards lifespan, healthspan, and HLM. ***Methods:*** Individuals living in Singapore participated in semi-structured group or individual discussions to explore (a) their understanding of lifespan and healthspan, (b) motivational factors for health behaviours, and (c) their awareness of HLM. Sampling maximised variation across age, sex, and ethnicity. Data obtained through 13 discussions were analysed with a mixed, inductive-deductive approach employing the HELO framework. ***Results:*** Thirty-six participants (mean age = 49.4 years, SD = 15.9, 19 males, 15 ethnic Chinese) were generally familiar with the definitions of lifespan and healthspan, emphasising the importance of quality of life. Health was defined comprehensively, and autonomy over behaviours was highly valued during ageing and in adopting health behaviours. Community resources and government health initiatives were deemed useful, recognising the potential to enhance social, mental, and physical health. Singapore's busy, achievement-oriented culture was identified as a barrier to healthy behaviours. Participants expressed enthusiasm for HLM's potential to extend the healthspan yet voiced concerns about lifestyle changes and potentially losing autonomy. ***Conclusion:*** Personal values and priorities were central to motivations towards healthy longevity. HLM

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should assess and align diagnostic and treatment plans with individual preferences to support sustainable health behaviours. The Singapore public's alignment with government policies presents an opportunity to promote HLM adoption.


## Introduction

The gap between lifespan (the number of years lived) and healthspan (the number of years lived in good health) stands at approximately 9 years globally [1]. This disparity is associated with a higher burden of non-communicable diseases and total morbidity [2], representing a global health challenge and urging the need for strategies to enhance healthspan. While medical advances have increased the lifespan beyond 80 years in many developed nations, the onset of morbidity has not been substantially delayed [3]. This has prompted an integrated longevity medicine approach that treats ageing as both modifiable and preventative, with the goal of extending healthspan alongside lifespan [4, 5]. Healthy Longevity Medicine (HLM) seeks to address this gap and optimise health and healthspan by targeting the ageing processes across the lifespan [6, 7]. Implemented globally in private and public clinics, HLM could offer personalised primary prevention against chronic conditions, emerging as a prominent public health strategy [8]. Despite its implications, the public's response to these practices remains unclear. Survey data reported diverse preferences regarding lifespan and health compromises [9, 10], as well as socio-demographic and ethical concerns surrounding healthy longevity [11], emphasising the complexity of perceptions around health and healthspan.

To promote healthy living and effectively implement HLM practices in accordance with the population's needs, understanding public opinions is pivotal. A conceptual framework has been developed to examine the determinants of public views towards healthy longevity [12]. The Healthy Longevity (HELO) framework examines three main determinants of public views: knowledge (the public's understanding of lifespan, healthspan, HLM, and biological age), awareness (public perceptions regarding the field of HLM), and motivational factors for pursuing healthy longevity (personality, current behaviours, personal values and beliefs, and health-related perceptions). This framework is meant to serve as a foundation for the creation of population surveys and, subsequently, tailored interventions or policy changes promoting healthy longevity.

The framework has been developed based on the scientific literature published on topics related to HLM and needs to be contrasted with the actual views of members of the public for its validation. This study is designed to explore and refine the HELO framework through a qualitative approach understanding public views towards healthy longevity. The aim of the study was to refine and nuance our understanding of: (a) the Singaporean population's understanding of lifespan and healthspan, (b) the factors underlying their motivations for engaging in specific behaviours relating to health, and (c) its awareness of HLM, illustrated through the concept of a HLM clinic.

## Methods

This qualitative descriptive study employing a focus group design was approved by the Institutional Review Board at the National University of Singapore (NUS-IRB-2022-877). Written informed consent was obtained from all participants prior to participation.

### *Participants*

Participants were adults aged 21 years or older living in Singapore. Recruitment posters were displayed at bus stops, community centres, and volunteer groups on social media. Maximum variation sampling was used to ensure the sample's diversity regarding age (21–39 years, 40–59 years, 60+ years), sex (male vs. female), and Singapore's four main ethnic categories (Chinese, Malay, Indian, and other). This required the use of additional targeted searches and snowball sampling to find participants with rarer profiles. After thematic saturation was reached (see under Data Analysis), data collection continued to ensure that all the above demographic characteristics were duly represented in the sample.

### *Procedure*

Focus group and individual discussions were conducted between May and September 2023. Participants completed a short demographic questionnaire containing questions on their smoking, drinking, and exercise behaviours. Group discussions included two to seven participants and made up most of the data collection sessions. Individual discussions were arranged for participants with logistical issues, such as time or location conflicts. Group and individual discussions lasted about 1 h. All sessions were organised, moderated, and co-

moderated by trained staff. The topic guide (see online suppl. material; for all online suppl. material, see https://doi.org/10.1159/000548994) explored public views towards health and followed the core domains outlined by the HELO framework [12]. The explored domains included health-related knowledge, personal values and beliefs, facilitators and barriers to current behaviours, as well as awareness of HLM and HLM clinics. Participants received a SGD 30 voucher for their participation.

*Data Analysis*

All focus groups were audio-recorded and transcribed using the open-source software Whisper [13], followed by manual proofreading by the research team. Analysis was based on the approach described by Braun and Clarke [14, 15] and used a combination of inductive and deductive thematic analysis [16] to organise the codes within the HELO framework [12]. Four researchers (B.W., E.S., A.S., Z.M.L.) independently reviewed and coded the transcripts for initial codes to identify potential themes. Recurring topics were grouped under common codes until overarching patterns emerged. Researchers held multiple meetings to discuss and consolidate themes and generate new codes for further coding until data saturation was reached (i.e., no additional themes were identified). Data were analysed in Microsoft Excel (version 1808).

## Results

A total of 36 individuals residing in Singapore participated in the study, with 32 interviewed through nine group discussions and the remaining four through individual discussions. Participants were aged 49.4 years (SD = 15.9) on average, 19 among them were male, 15 were Chinese, and 13 were employed full-time. More than half of the participants were married ($n$ = 22), had university-level education ($n$ = 22), exercised 150 min per week ($n$ = 27), and drank alcohol rarely ($n$ = 20). Two participants reported smoking. Table 1 summarises participants' demographic characteristics.

Themes were organised from general to specific, beginning with broad themes such as definitions of lifespan and healthspan, as well as personal values and beliefs. Transitions were made to more specific themes, such as resources in Singapore and participants' lifestyle choices. Awareness and views on HLM clinics were presented last as this was the most specific topic explored in the study.

*Knowledge of Lifespan and Healthspan*

Understanding of Lifespan

Participants provided varied conceptualisations of lifespan, reflecting both quantitative and qualitative aspects of the terms. Those who perceived it more quantitatively described it as the number of years lived regardless of health status:

> "Lifespan is how long you live, regardless of your health. Even if the person is in coma, he's still living. That is considered lifespan." (35-year-old Chinese male)

Other participants integrated qualitative aspects, such as the experience of happiness and well-being, into their definition of lifespan, essentially defining lifespan as healthspan:

> "You might be living a long life, but your quality of life is not good, and that defeats the purpose of having a good lifespan. So, I think it comprises both factors, quantity and quality." (39-year-old Malay male)

Understanding of Healthspan

Participants generally associated healthspan with the number of years spent in good health. Participants acknowledged that achieving perfect health throughout life is unattainable, recognising common minor ailments as part of human life:

> "Healthspan [. . .] means [. . .] we don't encounter [. . .] serious illness, aside from those normal colds, coughs [. . .] These are very, very normal things." (72-year-old Chinese male)

Healthspan was associated with quality of life, and participants also emphasised its subjective nature as health can vary over time and between individuals:

> "Healthspan can be the quality: how healthy you are. But again, it can be very subjective because there's no time point, where someone is completely healthy all the time." (35-year-old Boyanese female)

For some, healthspan encompassed a sense of stability, autonomy, and the ability to maintain control over one's life without needing assistance from others:

> "Healthspan would be from the beginning to the end. You should remain in your control, in your senses or in your balance where you don't need other people's help or [be] bedridden." (49-year-old Indian male)

The concept of healthspan was new to some participants, who expressed that they had not heard of it before. Their interpretations were guided by the context of the discussion:

> "Healthspan? Oh, I've never heard of that. [. . .] I guess, in the context of the conversation, [it] is perhaps the length of time you are healthy, you know, before things start [. . .] shutting down and going a bit bonkers as they tend to do at later time in life." (30-year-old Caucasian male)

**Table 1.** Demographic details reported by participants ($N$ = 36)

| Characteristics | *n* |
|---|---|
| Gender, female | 17 |
| Mean age, years (SD) | 49.4 (15.9) |
| Ethnicity | |
| Chinese | 15 |
| Indian | 9 |
| Malay | 5 |
| Other | 7 |
| Highest educational qualification | |
| Secondary or below | 8 |
| Post-secondary, diploma, and professional qualifications | 6 |
| University | 22 |
| Employment | |
| Employed full-time | 13 |
| Employed part-time | 3 |
| Freelance | 7 |
| Retired | 8 |
| Unemployed | 5 |
| Marital status | |
| Single | 11 |
| Married/in a long-term relationship | 22 |
| Divorced/separated | 0 |
| Widowed | 3 |
| Smoking, yes | 2 |
| Frequency of alcohol consumption | |
| Never/rarely | 20 |
| Once a week | 14 |
| Several times a week | 2 |
| Exercised ≥150 min/week | 27 |

SD, standard deviation.

*Factors Underlying Motivations towards Healthy Longevity*

Personal Values and Beliefs regarding Health and Sickness

Health was primarily conceptualised as the ability to function and maintain a sense of normality. Participants emphasised autonomy and the capacity to care for oneself without reliance on others as a core component of health:

> "What health means to me is being able to do our routine activities, our daily activities, taking care of ourselves without being dependent on others, and watching what we eat so that we are able to stay strong." (41-year-old Indian female)

Other participants defined health as the absence of pain, sickness, and restrictions, drawing from personal experiences of injury and recovery:

> "I had many surgeries because I had many sports accidents. So, health to me means that I don't have pain [. . .] that I feel enthusiastic getting up in the morning to be able to go through my day. [. . .] Health means that I do not have to worry too much of what I eat because I have no high cholesterol [. . .]" (61-year-old Caucasian male)

A more holistic perspective was provided by participants who associated health with happiness and fulfilment, reflecting a definition of well-being beyond physical health, which also encompassed mental and social health:

> "[Health means] to enjoy life, the way people will be enjoying and contribute as much as possible to the community as I can." (62-year-old Malay female)

Personal Values and Beliefs regarding Desired vs. Expected Lifespan

When prompted about their desired lifespan, participants provided a wide range of preferences, citing ages from 60 to 170 years. Some participants provided

benchmarks instead of a specified age, such as living up to the national average, living "as long as possible," or living long enough to see their grandchildren. Participants emphasised that their desired lifespan was contingent on several factors, such as maintaining cognitive function, avoiding being housebound, and not becoming a burden to others. The importance of quality of life was a recurrent theme:

> "I would want to live as long as it doesn't affect my quality of life. I mean, no doubt I want to live as long as I can get to see my grandchildren, but if, towards the end of the life, I cannot even remember them, I wouldn't want to spend my life just forget[ing] everyone and probably not be[ing] able to do anything. So, it really depends on the quality of life that I have." (46-year-old Chinese female)

When prompted about their expected lifespan, participants provided a range of ages 65–135 years, attributing their expectations to personal factors such as sedentary lifestyles or family health history. Some participants expressed the belief that life expectancy can be unpredictable despite one's efforts to maintain a healthy lifestyle:

> "For lifespan, I feel when sickness happens, it just happens. You know what, you [can] have the best diet, you can prevent yourself from taking certain things or maybe even more of it. But anything can happen. I mean, it's not those accidents. When something strikes you, it just happens. You can have [the] best exercise, you can have [the] best diet, you can prevent yourself from taking this or even take more of this; it can still happen." (72-year-old Chinese male)

### Perception of Health-Related Resources and Barriers in Singapore

In their everyday life, participants were aware of resources in Singapore to help them maintain a healthy lifestyle. At a national level, participants were broadly aware of government health campaigns and digital platforms, such as Healthier SG [17], Active SG [18], HealthHub [19], and Healthy 365 [20], which were commonly utilised by older participants:

> "When I go into the app, [activities under Active SG] will [be] publicised. And if I want to join them, I can just click, join and go to the place where they are doing the activities." (72-year-old Chinese female)

At the community level, neighbourhood infrastructures and local organisations were viewed as promoting social, physical, and mental health. Organised activities, such as brisk walking, helped foster a sense of belonging and social interaction:

> "I'm sure all residence committees will do that: the brisk walking every month. So it's usually on Sunday mornings. [. . .] We feel quite lazy to wake up, but still we make it an effort to go so that we catch up with the friends who we don't get to meet on a daily basis. So that's one way. And any other programmes or activities by the Community Centre or by the Residence Committee also encourages [to] make some friends here and there." (41-year-old Indian female)

A younger participant noted that these communal spaces enabled her older neighbours to engage in social and physical activities, enhancing community bonds:

> "I think in Singapore, in our community especially, we have those playgrounds [with] a fitness corner. [. . .] One of the things that the government has set up to help the people in the community age together. [. . .] I saw a few [. . .] older adults. They just made friends from there. And they'll be like, "– Oh, tomorrow, what time you coming? – 5 p.m. – Okay, let's come together." And that's when they start interacting with one another. Then when I see them, [it's] very heart-warming." (21-year-old Chinese female)

Barriers to utilising these resources included external factors such as weather conditions, as well as restrictions and regulations for using facilities. While many participants acknowledged the government's efforts in providing resources for healthier living, they also highlighted the need for resources that address the competitive nature of Singapore's work culture. Participants expressed a desire for more accessible financial and logistical support, including health check-ups, family bonding events, and meaningful engagement activities for older adults. Concerns about the affordability of healthcare and its impact on peace of mind were mentioned:

> "[. . .] one critical area is healthcare. As you grow older, you worry about becoming dependent and [. . .] finding affordable care. [. . .] if you're hospitalised for a serious illness or even a minor operation, it can [reach] up to five figures. My mom [had] a minor hip operation – it was five digitals. Of course, because she has insurance, most of the cost [was] contained. [. . .] If healthcare costs are being taken care of, mostly by the government, I think it gives people a lot of peace of mind because healthcare is one area where people are very concerned [about] in Singapore. I don't know whether you've heard [of the saying], "It's better to die than to go to the hospital and incur a large hospital bill." (50-year-old Chinese male)

### Facilitators of Healthy Behaviours

Participants described engaging in diverse health behaviours, including physical exercise (e.g., running, swimming), mental health practices (e.g., mindfulness, gratitude exercise), self-care (e.g., connecting with friends, spending time in nature), and healthy eating. Key facilitators of these behaviours emerged, with common internal facilitators being effective time

management and incorporating health activities into daily routine highlighted. External facilitators, such as participation in government-promoted health initiatives, were identified. Participants recognised the importance of community programmes in promoting health behaviours, such as healthier eating habits:

> "I retired at the age of 52 [. . .] and I want to spend more time to God. I must applaud the government because, besides going to the mosque, there is also a lot of collaboration with the community centre and other organisations. I participated in this activity, and I noticed that whatever I want to achieve, it's the right curriculum. When you go to the mosque, it is not only to pray but also to socialise. They collaborate with HDB (Housing & Development Board), and right now I am in the food business. So HDB also [do] talks about what food to eat and what not to eat, and we are like their ambassador because we cook for the mass." (62-year-old Malay female)

### Barriers to Healthy Behaviours

Participants nonetheless identified multiple barriers to adopting health behaviours, including lack of time and fatigue. One participant felt that the increasing demands of a professional career, over-emphasis on structured achievements, and the stress imposed by Singapore's competitive work culture kept individuals from actively engaging with Singapore resources that maintain healthy behaviours:

> "I noticed that mental health has been declining in Singapore, particularly among [. . .] students, and that's because they are mentally far too occupied to [be] engaged. There's far too much goals to meet in a fixed space of time. The density of work has increased [. . .] The plethora of communication apps has increased. That does not give the non-thinking part of the human brain time to relax and not think. [. . .] I don't think that's healthy at all." (60-year-old Chinese male)

Affordability and accessibility of unhealthy food, limited motivation or enjoyment to exercise, age-related health limitations, and the impact of family responsibilities were also highlighted. One participant described how balancing family duties and personal health goals can be challenging:

> "I think for me, I would like to be more active. I would like to play more sports. I think time is a big deterrent, because weekdays, it's so busy; by the time you get back home, you're exhausted, and you have to cook, see your children, do so many other things. And weekends, you know, you have grocery shopping, you have other things to do. There's no time, basically. And when there is time, you feel lazy. You want to just relax. You want to be in bed. You want to spend time with your family. And again, one is mom guilt. You know, you're out the whole day. You don't spend time with your children, and when you do have time, you want to spend that time with them and not go somewhere else for yourself. So that also plays a role. At least for me." (34-year-old Indian female)

## *Awareness of HLM*

### First Impressions of a HLM Clinic

Participants reported unfamiliarity with the concept of a HLM clinic. Participants associated the clinic's goals with broader health initiatives they had encountered previously. After providing a brief description of a HLM clinic, those who responded positively to the idea of the clinic highlighted several perceived benefits, including receiving personalised health feedback, having a structured plan for maintaining long-term well-being, and gaining a deeper understanding of their current health status. Participants also recognised the potential role of the clinic in addressing the healthspan-lifespan gap, seeing it as a proactive measure for managing chronic diseases and promoting a healthier population. One participant emphasised the importance of early intervention:

> "With people living longer, the national guideline is to address any chronic disease earlier and treat them before it becomes a tsunami of chronic illnesses at a later stage, so we do not impose too much on medical health. So, this [clinic] will be like feedback on your personal health, and if it's possible, if the person is young, they can treat and reverse this process as quickly as possible. This will be a good starting point for the person to take on a healthier lifestyle to prevent chronic diseases later, [which benefits] the family and the nation as well." (55-year-old Chinese male)

Some participants expressed ambivalence or concerns about the clinic, raising issues such as potential information overload, uncertainty about which health advice to follow, intervention costs, and the novelty of the intervention plans. Participants feared the possibility of receiving unexpected health diagnoses and the impact of lifestyle changes. This uncertainty was captured in the following comment:

> "The idea of going. . . To have a good look at what is going on inside my body [. . .] – more data is always better. It depends on the kind of plans, what comes out of it. [. . .] If there is a medication [. . .] or a new supplement I was not aware of that has an effect on me. [But], I do think it has to be very [. . .] convenient. It has to be something that really fits within my lifestyle." (50-year-old Caucasian male)

### Expected Interventions at a HLM Clinic

Participants showed varying levels of understanding regarding potential interventions and assessments aimed at promoting health. Participants named specific assessments they anticipated would be part of the clinic's services, such as bone density scans, genetic testing, and personalised advice on diet and exercise. Others explicitly stated that they did not wish pharmaceutical interventions to be the primary focus of the clinic. Participants expected a more general check-up or expressed uncertainty about what to expect at the clinic:

"It's such a nebulous idea. So health can range from [. . .] a bum knee to cancer to [. . .] your brain falling out or whatever. So I don't know. It's hard to say what I'd like to see because I would like to see a nice general check-up, essentially. For a medical professional to hit all the big key, you know, the greatest hits of health. [. . .] I don't know actually really what they are; maybe a scan of some variety. I don't know, flashy lights and a big laser that goes across my head going "beep, beep." Yeah. I would like a sort of [. . .] score, you know, 8 out of 10, good job, couldn't do better." (30-year-old Caucasian male)

Willingness to Visit a HLM Clinic

Participants were open to the idea of visiting the clinic, citing reasons such as the opportunity for personalised feedback on health, planning for the future, and general curiosity about the clinic. Participants emphasised the importance of minimising logistical barriers, such as long queues and inconvenient clinic locations. Affordability also emerged as a significant factor, with participants advocating for subsidies or government support to ensure accessibility. One participant remarked on the need for public sector involvement:

"I think most important is healthcare insurance. I think the government should support [the clinic]. [. . .] If it's going to be government, then it's the Ministry of Health (MOH) because they are the ones doing the HealthHub, so I think they should be part of it as well. Because if it's not MOH, then who? So I think they should be more involved in this thing because you are the frontline, so why wouldn't you help?" (33-year-old Chinese male)

Participants who expressed reluctance to visit cited concerns about feeling controlled, preferring to let nature take its course, or feeling confident in their ability to manage their own health without external intervention. One participant expressed this sentiment:

"We already know there's a lot of sources [telling us] how to stay healthy. It's not required that I need to visit that particular clinic to know that. So obviously, when we go there, the tendency is to, okay, let me just check this. So it might be like falling into a pit. I would prefer to stay away. Yeah, as long as I'm able to do my daily routines and I don't have any big complaints, I think I'm good." (41-year-old Indian female)

## Discussion

Middle-aged individuals residing in Singapore demonstrated a strong understanding of lifespan and were mostly familiar with the concept of healthspan. They defined health comprehensively, emphasising autonomy and control over their behaviour. In terms of factors underlying their motivations for engaging in health behaviours, participants recognised the value of community resources and government-led health initiatives, acknowledging the potential to improve not only physical health but also social and mental health. Participants identified Singapore's achievement-oriented culture as a barrier and noted a lack of time to adequately care for their health. Although participants were not aware of HLM, they expressed enthusiasm about its potential to extend healthspan. Concerns about the need for lifestyle changes and the possibility of losing control over their way of life were recurrent when considering visits to a HLM clinic. These findings highlight the importance of individual values and priorities in shaping motivations towards healthy longevity.

Participants had an overall strong knowledge of the lifespan and were also familiar with or could interpret the meaning of healthspan. Participants tended to incorporate their own values into their definitions of lifespan and healthspan, which sometimes also encompassed quality of life. This echoes a holistic understanding of health as physical, mental, and social health, which was repeatedly brought up during discussions. Members of the public in Singapore adopting such a biopsychosocial perspective could have several explanations. First, mental health awareness is increasing in the world, with mental health and well-being gaining more visibility in the mass media and on social media [21]. Second, Asian cultures have an inherently more holistic approach to health than Western medicine [22]. Finally, whereas somatic medicine is well subsidised in Singapore, mental healthcare remains less accessible, making it a potentially stronger health-related concern [23].

In contrast to a broad understanding of health, there were also participants whose definition of health focused on a specific aspect, such as retaining one's level of functioning. Some participants' perspectives on ageing reflected a similar mindset: not necessarily wishing for a long life, but on maintaining the values and activities most important to them, such as spending quality time with their grandchildren or contributing to society. Drawing from Self-Determination Theory, these perspectives could be interpreted as autonomous motivations, which are intrinsic to individuals or result from well-integrated external sources (e.g., social norms a person has internalised in their own system of values) [24]. Extending this emphasis on autonomy in one's health trajectory, health locus of control offers a

complementary perspective. Health locus of control refers to the belief that health outcomes are determined either by one's own actions (internal) or by external forces such as chance, fate, or the influence of others (external) [25, 26]. This concept could help explain the findings in the study further, as participants perceived their health outcomes as largely determined by their own actions rather than external factors. Together, these perspectives highlight the role of personal responsibility, life choices, and engagement with available resources in shaping motivations towards healthy longevity.

Participants also expressed enthusiasm for external sources of motivation, such as national healthcare apps, community activities, and government-led programmes. Instead of experiencing them as sources of controlled motivation, i.e., motivations solely driven by external rules and rewards not aligned with one's individual values [24], participants appeared to view these infrastructures as genuinely valuable resources providing opportunities to reinforce social cohesion and connectedness. This aligns with other Singaporean studies finding that Singaporeans trust their government with respect to health advice [27] and tend to align their perspectives on health with government-led information campaigns [28]. Such receptivity may be explained by Singapore's collectivist cultural orientation and high level of trust in public service institutions, surpassing other Confucian Asian countries such as China, Japan, Hong Kong, Taiwan, or Vietnam [29]), independently of the ethnic background of Singaporeans [30]. Higher levels of collectivism and trust are associated with a higher likelihood of individuals compliance with health interventions perceived as beneficial to the community and aligning with social norms [31]. This aspect of the local culture can be leveraged for the promotion of HLM. Yet, this finding also highlights that public trust in the government may vary considerably between countries and needs to be evaluated in each nation when investigating views towards HLM or the impact of any HLM-related policy.

These observations can be situated within the broader empirical literature linking culture with health behaviours. Emerging evidence from Asian and cross-national studies, notably in the context of COVID-19, underscores how cultural orientations and trust jointly shape responses to government-led health initiatives. For instance, research across eight Asian countries found that social norms explained more variance in vaccination intentions in "tighter" cultures such as Indonesia, Vietnam, and Singapore, where there is a lower tolerance of social norm deviance than in "looser" cultures [32]. Comparative work in Mainland China and Taiwan showed collectivist interpretations of the pandemic – which reflected beliefs that the pandemic is a national issue as opposed to a personal issue – positively predicted acceptance of stringent preventive measures. In addition, trust in government was a strong positive predictor of acceptance [33]. Complementing these findings, a study of 46 countries found that uncertainty avoidance, individualism, and long-term orientation shaped public support for vaccination and quarantine mandates, of which the latter two moderated how fairness beliefs translate into policy support [34]. Taken together, these studies show that public reception of preventive health interventions reflects a variety of cultural orientations, including those that often characterise the Singapore public.

However, participants also highlighted the downsides of Singapore's achievement-focused culture, which they found incompatible with a satisfactory work-life balance or with sufficient time to lead a healthy lifestyle. Consistently, both perceived time pressure and objectively long working hours have been identified as barriers to health behaviours in prior studies [35, 36]. These factors should be considered and addressed by treatment plans provided in the context of HLM.

Finally, while Singaporeans acknowledged the appeal of HLM, their primary concerns about treatment in such a clinic included the fear of losing control over their health or of having to change their lifestyle too much to comply with the clinic's recommendations. Similarly, a sense of control and accomplishment were found important enablers for long-term adherence to health behaviour interventions in chronically ill patients [37]. This supports the need for HLM to generate autonomous motivations by aligning health behaviours with each individual's preferences and values as much as possible. Affordability and institutional support are also key considerations as Singapore's healthcare system combines personal responsibility with government-led subsidies and financing schemes to ensure access to care [38].

Strengths of the present study include its focus on investigating a yet scarcely explored public health question, namely, public views towards HLM, as well as its diverse, multi-ethnic sample, encompassing adults of all ages, and from diverse backgrounds. Singapore provides a unique location to conduct such as study as it mixes Asian and Western cultural influences, while also having high levels of variability in terms of culture, living habits, and activities [39]. The sample was intentionally heterogeneous to capture Singapore's diverse

demographics, while remaining homogeneous in terms of national identity. Future research could explore perspectives in specific demographic subgroups to inform more tailored health strategies.

Regarding this study's limitations, participant recruitment may have been subject to selection bias, as likely only individuals interested in health, healthy longevity, or HLM volunteered to participate. For instance, this may explain the low proportion of smokers in the sample. Furthermore, participants who had time to spare for the discussion may have had more free time or an overall more comfortable quality of life than many others in Singapore. Finally, the study's design did not include any follow-ups with participants, making it impossible for the study team to refine some of the findings by revisiting them with the same participants.

The present work augments existing efforts to understand public views on healthy longevity, such as the HELO framework. Most elements mentioned by participants mapped well on the framework's initial structure and included constructs. Certain elements included in the framework, such as ageism, were not explored by participants. The present study highlighted a strong focus on mental and social aspects of health in the Singaporean population, which was not explicitly reflected in the HELO framework. These aspects will need to be investigated quantitatively, ensuring the inclusion of related questions in the HELO population survey. It also found the need to retain autonomy, remain self-reliant, and in control of one's health and life choices to be important factors for Singaporeans when considering any future plans or behavioural changes. These values may be particularly important to address during HLM interventions or when promoting HLM clinics.

## Statement of Ethics

This study was reviewed and approved by the Institutional Review Board at the National University of Singapore, Approval No. NUS-IRB-2022-877). Written informed consent was obtained from all participants prior to participation.

## Conflict of Interest Statement

Andrea B. Maier was a member of the journal's Editorial Board at the time of submission. The other authors declare that they have no competing interests.


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## Author Contributions

B.W., A.S., E.S., E.J.H., P.A.O., L.I., S.R., and A.B.M. contributed to the study conceptualisation and methodology. Investigation and project administration were led by B.W. and supported by E.S. Formal analysis was led by B.W. and A.S. and supported by E.S. and Z.M.L. The first draft of the manuscript was written by B.W. and supported by A.S. This project was supervised by A.B.M. All authors commented on previous versions of the manuscript and read and approved the final manuscript.

## Data Availability Statement

The data that support the findings of this study are not publicly available owing to ethical considerations as the qualitative nature of the data could permit potential reidentification of participants. Data are available from the corresponding author via a.maier@nus.edu.sg upon request.

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