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Development of a Longitudinal Database on Adult Development and Aging

成人發展追蹤研究

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 Hong Kong Freelancer Service Union
 Hong Kong Institute of Security Professionals
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Glossary of Terms

ADL	Activities of daily living
ANOVA	Analysis of variance
BFI-S	Big Five Inventory-Short form
CEDS-R-10	10-item Center for Epidemiologic Studies Depression Scale Revised
CEF	Continuing Education Fund
CHARLS	China Health and Retirement Longitudinal Study
Chi-square test	Analysis of frequency distribution
COVID-19	Coronavirus Disease 2019
ELSA	English Longitudinal Study of Aging
FS-8	8-item Flourishing Scale
F-test	Analysis of variance equality
HKADA	Hong Kong Longitudinal Study on Adult Development and Aging
HPLP-II	Health Promoting Lifestyle Profile II
HRS	Health and Retirement Survey
IADL	Instrumental activities of daily living
ICT	Information and communications technology
IPANASSF	International Positive and Negative Affect Scale Short Form
MCI	Mild cognitive impairment
MoCA	Montreal Cognitive Assessment
MMSE	Mini-Mental State Examination
MPF	Mandatory Provident Fund
RHS	Retirement and Health Study
SCS	Sense of Control Scale
SD	Standard deviation
SE	Standard error
SES	Socioeconomic status
SWLS	Satisfaction with Life Scale

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Executive Summary

Abstract of the Research

Population aging is a global issue and addressing the needs of the aging population poses large challenges. According to the local statistics, the life expectancy at birth had increased to 83.2 years for men and 87.7 years for women in 2021 (Department of Health, 2022). Despite numerous efforts to uncover factors influencing healthy aging, there is a lack of systematic empirical data to understand the developmental trajectories of middle-aged and older Hong Kong Chinese adults. Therefore, the current project aims to develop a local longitudinal database on adult development and aging to record the within-individual changes in physical and mental health, social relationships, and cognitive functioning over time. Data of this longitudinal database are valuable for future investigation on developmental trajectories of local aging populations and will provide rich empirical data for making future long-term policies related to the aging population.

This project started in November 2020 and ended in January 2023, with the major goal of establishing the baseline measures of the Hong Kong Longitudinal Study on Adult Development and Aging (HKADA). A total of 2392 Hong Kong Chinese residents aged 45 years and above were successfully recruited and completed a face-to-face interview and standardized physical and cognitive assessments. In addition to the modules commonly covered in other international databases, such as demographic information, employment, physical health and psychological characteristics, the current project specifically focused on examining the latest situation in retirement preparation, participation in volunteering activities, cognitive function, utilization of healthcare services, and information and communications technology (ICT) use for various purposes. The data of the current project are publicly accessible at the project webpage (<http://personal.cityu.edu.hk/ylyeung/HKADA.htm>).

Layman Summary on Policy Implications and Recommendations

The following recommendations are drawn based on the results of the four research questions examined in this baseline study of HKADA.

Recommendations for retirement-related policies:

1. The level of retirement preparation remains low, especially among non-working

individuals. The current research has shown that the individuals with lower retirement preparation were more likely to experience reduced psychological well-being. Thereby, encouraging both working and non-working adults to make early preparation for retirement and old age is recommended.

2. Among the four types of preparatory behaviors for retirement, the participants mainly carried out financial and health planning. Other preparatory activities such as psychological and social planning should also be covered in the pre-retirement planning workshops and seminars.
3. Only about 16% of the working participants aged 45 – 64 years expected to work beyond the typical retirement age of 65. In the face of manpower shortage, identifying the factors that can motivate working adults to stay in the workforce is recommended.

Recommendations for healthcare policies:

1. Both age groups heavily utilized public medical system for healthcare services such as outpatient services and hospitalization. Given the limited capacity of public hospitals, the government is recommended to engage more private sectors through the Public Private Partnership (PPP) Programme and other initiations to divert more healthcare services to the private sectors.
2. About 15% of the older participants in the current community-dwelling sample were suspected of having mild cognitive impairment (MCI). It is recommended to allocate more resources to provide screening services to individuals aged 65 years and above, enabling early detection of cognitive declines and early intervention for the at-risk groups.
3. The purchase of health-related insurance products remained low in both age groups (45-64 years and 65+ years), especially over 75% of the older participants and over 50% of younger participants did not have any health or critical illness insurance. It is recommended to continue to promote the tax-deduction for qualifying premiums paid under the Voluntary Health Insurance Scheme among working adults, to reduce the demand for public healthcare services.

Recommendations for policies related to the development of smart city:

1. The ICT use among the two age groups remains limited, especially the majority of older participants did not use ICT for non-social purposes, such as online banking and online medical consultation. Training programs on ICT should extend the topics from ICT use for social and leisure purposes to financial and medical purposes in order to increase middle-aged and older adults' use of the latest technologies.
2. Only about half of the current sample indicated their intention to take part in continuing education programs to advance their ICT knowledge and skills. It is recommended to provide incentives to motivate both age groups to enroll in education programs to improve their ICT literacy.

行政摘要

研究摘要

人口老化已成為全球不可忽視的社會問題之一，持續的老齡人口增長及需要，為社會帶來前所未有的挑戰。香港統計數據顯示，在 2021 年，男性出生時的預期壽命已經增至 83.2 歲，女性則是 87.7 歲（衛生署，2022）。儘管各界人士已竭力探索影響健康老齡化的不同因素，但香港至今仍缺乏有系統的數據來揭示香港中年和老年人在生理、心理、認知和社會文化領域的發展軌跡。因此，本研究項目旨在建立一個香港本地的成人發展及老齡化縱向數據庫，記錄香港中年及老年人在身體和心理健康、社會關係和認知功能方面隨年齡增長的變化。這個縱向數據庫的數據對長遠探索香港老齡化人口的發展軌跡大有裨益，同時亦為今後制定與老齡人口相關政策提供豐富的科學數據。

本研究項目於 2020 年 11 月開始，於 2023 年 1 月結束，主要目的是建立香港成人發展追蹤研究的基線測量。本研究成功招募了 2392 名 45 歲及以上的香港居民，並完成了一對一面談環節和標準化的身體及認知能力評估。除了其他國際數據庫（例如美國健康與退休研究、中國健康與養老追蹤調查）普遍涉及的範疇，例如人口特徵、工作狀況、身體健康及心理特徵等，本研究項目特別針對以下五個範疇進行進一步分析，包括退休準備、義務工作的參與、認知功能、醫療保健服務的需求，及使用不同資訊和通訊科技（ICT）的情況。相關數據可在項目網頁（<http://personal.cityu.edu.hk/ylyeung/HKADA.htm>）公開查閱。

研究項目對政策影響和政策建議的摘要

以下建議是基於香港成人發展追蹤研究基線測量中四個研究問題的結果而提出。

與退休政策相關的建議：

1. 香港市民普遍有較少的退休準備，尤其是非在職人士。本研究發現，退休準備程度較低的人士很大機會有較差的心理健康。故此，本研究建議鼓勵所有在職和非在職人士及早為退休和晚年生活作準備。
2. 在四類退休準備行為中，本研究參加者主要就財務和個人健康作規劃。退休前的規

劃工作坊和講座，應進一步涵蓋心理和社交等方面的規劃準備。

3. 在 45 – 64 歲的在職參加者中，只有約 16% 的人預計會在 65 歲的普遍退休年齡之後繼續工作。面對人力短缺，本團隊建議將來的研究應探索鼓勵在職人士繼續工作的因素。

與醫療保健政策相關的建議：

1. 兩個年齡組別（45 – 64 歲和 65 歲及以上）的參加者均倚賴公共醫療系統所提供的門診和住院等醫療服務。鑑於公立醫院的能力有限，建議政府通過公私營協作計劃及其他措施為病人提供更多醫療選擇，將醫療服務轉移給更多的私營醫療機構。
2. 本研究的社區樣本中，大約有 15% 的年長參加者懷疑患有輕度認知障礙 (MCI)。故建議分配更多資源，為 65 歲及以上的人士提供篩查服務，以識別高危組別，及早發現認知能力下降及提供干預服務。
3. 兩個年齡組別的參加者的健康相關保險產品的購買率皆偏低。當中超過 75% 的年長參加者及超過 50% 的中年參加者完全沒有購買任何健康或危疾保險。本研究建議繼續向在職人士推廣自願醫保合資格保費的稅務扣減，以減少對公共醫療服務的需求。

與智慧城市發展政策相關的建議：

1. 兩個年齡組別的參加者在資訊和通訊科技 (ICT) 的使用仍然偏低，尤其是大多數年長參加者從不使用資訊和通訊科技作非社交用途，例如網上銀行和線上醫療諮詢。目前的資訊和通訊科技培訓計劃，應將主題從社交和休閒用途擴展到金融和醫療用途，以增加中老年人使用最新的科技。
2. 只有大約一半的參加者表示他們有意打算持續進修，以提高他們的資訊和通訊科技的知識和技能。本研究建議提供誘因，以鼓勵兩個年組別的人士參加進修計劃，以提高他們的資訊和通訊科技的水平。

1. Introduction

Hong Kong, like many other regions throughout the world, is facing a growing aging population, with men and women's respective life expectancies at birth increasing to 83.2 and 87.9 years in 2021 (Hong Kong Department of Health, 2022). Despite the prolonged life expectancy in Hong Kong, the developmental trajectories of middle-aged and older adults in Hong Kong are under-researched. The lack of information on the developmental trajectories prevents proper understanding of the factors contributing to the well-being of Hong Kong middle-aged and older adults. It also hinders the accurate estimates for the increased demands for local healthcare services. With the prolonged life expectancy, older adults in Hong Kong are also expected to have a lengthened retirement life. Whether the resources accumulated during the employment period are sufficient to maintain the quality of life in such a prolonged retirement life remains largely unexplored. In an attempt to systematically uncover the individual changes in physical, cognitive, and psychosocial domains among middle-aged and older Hong Kong adults, the current project aimed to develop a locally valid database that can keep track of the developmental trajectories of middle-aged and older Hong Kong Chinese adults in the abovementioned aspects. This longitudinal database will provide valuable empirical data for policy makers to develop future policies in relation to the aging population.

1.1 The Need for a Longitudinal Database on Adult Development and Aging

Paul Baltes (1987) identified four key features in human development. First, multidirectionality, which emphasizes that development involves both growth and decline. Second, plasticity, which states that one's capacity can be changed even in late life. Third, multiple causation, which stresses on the influences of biological, psychological, social-cultural and life-cycle forces on human development. Fourth, historical context, which reveals the importance of historical events in which people grow up. The importance of gerontological research is recognized worldwide with regards to the age-related changes in physical and mental health. To systematically understand longitudinal changes in physical and cognitive abilities and evaluate the impacts of biological, psychological, and sociocultural forces on development in late life, establishing a longitudinal database for middle-aged and older Hong Kong Chinese adults is essential.

Other nations had developed their biennial surveys for more than a decade [e.g., Health and Retirement Survey (HRS) in the United States, English Longitudinal Study of Ageing (ELSA) in England, China Health and Retirement Longitudinal Study (CHARLS) in Mainland China]. Singapore also launched its nation-wide survey, Retirement and Health Study (RHS), in 2014. These panel studies aim to uncover individual growth trends and societal changes in their nations (Smith, 2013). Numerous policy suggestions have been generated from research based on these longitudinal panel databases (e.g., USA, England, China, and Japan). For example, using HRS data, Hung et al. (2011) analyzed trends in developing chronic diseases and disabilities of older adults across different time points. They found age and gender differences in disability trends for daily activities, mainly amongst the oldest old and in women, and identified the average age of onset of impairment and the major symptoms prior to clinical diagnosis.

Despite its rapidly aging population, Hong Kong lags far behind in systematically knowing her people's developmental experiences, especially for those in the middle and late adulthood. For instance, little information is available concerning longitudinal changes in physical and cognitive abilities among the middle-aged and older adults and whether these developmental trajectories vary from one cohort than the others. These clusters of findings are critical in making policies for the aging population (e.g., provision of health checkup for the high-risk group).

In Hong Kong, the Census and Statistics Department conducts population censuses and thematic surveys in identifying demographic and social trends of the region. However, simply utilizing cross-sectional data where the sample collected differs at every wave of assessment does not reflect individual changes over time. The cross-sectional surveys also limit the identification of the causes and effects of individual and social changes (Firebaugh, 2007). In contrast, a longitudinal sequential design enables researchers to follow multiple age groups at multiple discrete time points. It can potentially identify age, cohort and period effects. Hence, longitudinal assessment is important for formulating aging-related policies. With the development of a longitudinal database, a wide range of growth patterns of the mid-age and aging population can be examined.

The current project, therefore, aimed to develop a locally valid and representative longitudinal database for middle-aged and older Hong Kong adults. Specifically, the current

project targets to provide the first wave (i.e., baseline) of data of the longitudinal database among Hong Kong Chinese adults aged 45 years and above.

1.2 The Situation in Hong Kong

With the increase in longevity and especially the reduction in fertility, about 1.32 million people (17%) in Hong Kong was aged 65 or above in 2019, which is expected to increase to 2.52 million (31%) in 2039 (Census and Statistics Department, 2020). The elderly dependency ratio (i.e., the number of persons aged 65 and above per 1000 persons aged 15 – 64) will be doubled from 231 in 2016 to 527 by 2036. Statistics have also shown an increase in persons with chronic diseases who aged 60 and above from 63.9% of the total population with chronic diseases in 2013 to 67.6% of the total population with chronic diseases in 2020 (Census and Statistics Department, 2015; 2021).

These statistics reveal that there will be a higher demand for healthcare services in the coming decades, leading to a rapid rise in healthcare expenditure by the government. In 2022, the expenses on Education, Social Welfare, and Health domains account for nearly 60% of the total recurrent government expenditure (Hong Kong Government, 2022). Among these domains, the healthcare expenditure is weighted about 37.4% (i.e., HKD127.9 billion) of Hong Kong government's total recurrent expenditure in 2022 – 2023. It will become increasingly challenging to continue providing higher spending in the healthcare sector while sustaining other social welfare supports. In addition to the rising elderly dependency ratio, the situation of lower tax revenue having to support a higher spending in healthcare, pensions and other benefits will soon take its toll. The aging process is inevitable and multiple forces in the financial, societal, and familial aspects have to be addressed in order to examine growth trends that lead to healthy aging (Baltes, 1987). However, the Census and Statistics Department is only able to offer recommendations based on the cross-sectional findings, which are unable to examine the growth trends of the mid-age and aging population and cannot adequately identify the risk and protective factors for developmental changes. As a result, multiple waves of within-individual assessments using a longitudinal design, such as panel studies, are necessary to systematically understand the developmental trends of middle-aged and older adults.

Longitudinal studies provide the opportunity to study the aging process across different domains such as psychosocial, physical, behavioral, and cognitive spheres. For instance, data from the ELSA revealed that worry about health (cognitive domain) was associated with less

physical activity (behavioral domain), which predicted greater walking difficulties (physical domain) among older adults in a 6-year follow-up (Li et al., 2009). In addition, the findings of HRS showed that physical activity trajectories, i.e., the patterns of longitudinal changes in physical activity (behavioral domain) were found to be similar between husbands and wives (social domain) in middle-aged and older couples (Li et al., 2013).

Regarding the current research project, there are specifically a few aspects of interest that are directed to not only understand potential problems during the aging process in Hong Kong, but also to help generate insights to future intervention programs to minimize the negative impacts of age-related declines on well-being. These aspects include retirement preparation, participation in volunteering activities, cognitive function, utilization of healthcare services, and information and communications technology (ICT) use for various purposes.

1.3 The Current Research Project

The current research project aims to establish a baseline assessment of the **Hong Kong Longitudinal Study on Adult Development and Aging (HKADA)** to document the developmental trajectory among a representative sample of local residents aged 45 and above. It aims to provide comprehensive longitudinal data to unveil individual changes in physical and mental health, social relationships, and cognitive functioning among middle-aged and older adults. The development of HKADA survey as well as the minimum age of 45 years as the inclusion criterion was referenced to the two leading international panel studies, namely, HRS and CHARLS, which allows international comparison at a later stage. The results of HKADA will provide a fundamental knowledge base that serves the needs of scientific and policy research on aging-related issues in the long-run. In addition to the development of the baseline study of HKADA, the current project will explore the following broad research questions using the cross-sectional data:

RQ1: Which individual attributes do predict retirement preparation?

RQ2: Does participation in volunteering activities predict the well-being in middle and late adulthood?

RQ3: Which individual and behavioral attributes do predict cognitive function?

RQ4: What are the predictors of utilization of healthcare services?

2. Objectives of the Study

The main objectives of the current research project are:

- (1) To develop a local database on a wide array of domains, including physical, social, and psychological, and cognitive aspects to understand longitudinal changes in middle and late adulthood.
- (2) To establish a baseline study for this database as preparatory work for future investigation on developmental trajectories of middle-aged and older adults.
- (3) To provide a publicly accessible scientific database for formulating long-term aging policies.
- (4) To systematically evaluate the effects of pre-retirement individual attributes, such as retirement planning, productivity, and social engagement, on physical and psychosocial well-being of older people.

3. Research Methodology

3.1 Study Design

This longitudinal database, HKADA, records middle-aged and older Hong Kong Chinese adults' multidirectional developmental trajectories, including their physical, cognitive, and psychosocial development. The current research project made use of a mixture of data collection modes, including self-reported questionnaires, one-on-one in-depth interview, and standardized physical and cognitive assessments, to provide empirical baseline data for HKADA. Upon funding availability, biennial follow-up assessment for the same participant will be carried out using the identical data collection methods (i.e., self-reported questionnaires, one-on-one in-depth interview, and standardized assessments).

3.2 Sampling and Participants

Multiple efforts were made to obtain a representative sample for HKADA. The sample was selected by first stratifying the computerized addresses records of Census and Statistics Department by the geographical area and the type of quarter, then applied the systematic replicate sampling. A total of 12 replicates conveying 7076 quarters/addresses were obtained from the Census and Statistics Department as the sampling frame. All residential addresses in

the 18 district councils were evenly distributed in those 12 strata, with approximately 500 addresses each. Invitation to join the research study was sent to these 7076 residential addresses by mail. However, due to the fourth wave of the COVID-19 outbreak during the beginning stage of this project (November 2020 to May 2021), the response rate (1.27%) was unsatisfactorily low. Accordingly, alternate sampling methods were adopted to reach out target participants in the community during the COVID-19 pandemic. In particular, invitations were sent to all district councilors in Hong Kong, non-governmental organizations serving middle-aged and older people, and labor unions and professional associations by letters or emails, followed up by phone calls. Ninety-four non-governmental organizations and 590 labor unions were contacted. Among them, eighteen non-governmental organizations (response rate: 19%) and 20 labor unions (response rate 3%) agreed to promote this project among their members through emails, calls, or flyers.

A total of 2392 participants were successfully recruited and took part in the interview and assessments. Adopting the age criterion of CHARLS and HRS (Zhao et al., 2012), all participants in the current project were 45 years or older and residing in households (non-institutionalized individuals). Other inclusion criteria were (1) being Chinese, (2) spoke either Cantonese or Mandarin, and (3) had been living in Hong Kong for at least three months in the past six months (referenced to the Census and Statistics Department's definition of a usual resident). One participant was excluded from the final sample as he/she refused to report his/her personal information after multiple attempts. Therefore, the final sample for the following analyses is 2391. Among them, there were 227 pairs of couples where both partners ($n = 454$; 18.99% of the sample) participated in this project.

There were 193 participants who only partially completed the data collection procedure (e.g., those who only completed the self-reported questionnaire but not the face-to-face assessment; please see Section 3.3 *Procedure* for a detailed description of the mode of data collection). The major reasons of these partially completed cases included the concerns of being infected with the COVID-19 virus and invalid contact means. The incomplete cases were comparatively younger than the participants who completed all assessments ($M_{diff} = -4.43$, $p < .001$). However, in terms of their gender and education level, there were no significant differences between the incomplete and completed cases. These participants were excluded from the following analyses.

3.3 Procedure

Ethical approval was first sought from the Human Subjects Ethics Sub-committee of the affiliated university (Reference Number: 3-3-202002-02) before the commencement of data collection. In the initial stage of the project using the sampling frames obtained from the Census and Statistics Department, an invitation letter for participation was sent to the randomly drawn addresses, in which the objectives and nature of the study was stated. Eligible individuals could reply to the letter to indicate their willingness to participate in the study. This sampling method was later complemented by the alternate sampling strategies reported in Section 3.2.

Given the large volume of information gathered throughout the data collection period, both self-reported questionnaire and one-on-one structured interview and assessment were adopted. A consent form was first obtained from each participant before collecting their personal information. The self-reported questionnaire covered demographic variables, health, work, retirement preparation and psychological characteristics, which took approximately 30 minutes to finish. Depending on the preference of the participants, participants could fill in either the printed or electronic version of the self-reported questionnaire that was sent to the participants by post or by email, respectively. Assistance was provided to the participants who could not complete the self-reported questionnaire themselves due to their education level or eyesight problems. Upon receiving the returned self-reported questionnaire from participants, a one-on-one interview, together with the standardized physical and cognitive assessments, was arranged and conducted by trained interviewers.

The research team of HKADA contacted participants by phone or instant message to notify them in advance of the face-to-face interview and physical and cognitive assessments. The interview and assessments took place in the Psychology Laboratories of the affiliated university or the residence of the participants, with exceptions for a small part of participants where the interview took place in the community centers where they were recruited. Each interview and assessments were carried out by a trained interviewer, and the eligible respondents answered all questions in the main interview about themselves. Due to the social distancing policies imposed during the COVID-19 outbreak (the fifth wave during January to May 2022), a small proportion of participants (< 5%) completed the interview using telephone. Similar practice (i.e., telephone interviews) has also been used in other panel studies during the COVID-19 pandemic (e.g., HRS: Beydoun et al., 2022). It took about 60 – 90 minutes to complete the interview and assessments. Each participant was given HKD150 as a token of

appreciation for his/her participation in the entire interview and assessments. On average, the entire questionnaires and assessments were completed in 1.5 – 2 hours.

3.4 Measures Included in the Baseline Study

In line with HRS and CHARLS, the HKADA was designed to facilitate the interdisciplinary examination of aging issues in the local context. The survey collected data on a broad coverage of modules, including demographic information, physical health, behavioral risks, cognitive function, psychological characteristics, healthcare utilization, employment and retirement preparation, the use of ICT, social support, living arrangement, expectations toward future, and participation in volunteering activities. The survey was written in Chinese, with the use of the validated Chinese version for most of the measurement scales. Each module is described in the following sections:

3.4.1 Demographic Information

The demographic information of the participant as well as that of his/her spouse (if applicable) were recorded, including age, place of birth, gender, religion, highest educational attainment, marital status, residential district, the type of housing where they lived. The demographic information of the participants' parents and children (if applicable) was also recorded.

3.4.2 Socioeconomic Status

The socioeconomic status was measured by the single item from MacArthur Scale of Subjective Social Status (Adler et al., 1994) to assess one's perceived rank (including income, education, and job prestige) relative to others in their group. The participants were asked to rate their socioeconomic status with the ladder ranged from 1 (worst off with the least money, least education, worst job, or no job) to 10 (best off with the most money, most education, and best job). The higher score indicates the individual perceived a higher socioeconomic status.

3.4.3 Physical Health

This module measured various aspects of participants' health, including self-reported general health, chronic illness and/or disability, eyesight and hearing abilities, specific diagnoses and symptoms, pain, and difficulties in a range of activities of daily living. Apart from the self-reported health-related measures, various objective indicators, including blood

pressure, hand-grip strength, visual acuity, walking speed, balance, were also assessed and recorded in the face-to-face interview session.

Self-reported Health. With reference to HRS, participants' self-perceived physical health was assessed using a single item "How was your physical health condition in the past month?" Participants were asked to respond to this item on a 5-point Likert scale ranging from 1 (very poor) to 5 (very good). Moreover, they were asked to rate their eyesight and hearing abilities using a 5-point Likert scale (1 = poor to 5 = excellent) and indicate any difficulties in performing activities of daily living (ADL) (Katz et al., 1970) and instrumental activities of daily living (IADL) (Lawton & Brody, 1969) (1 = no difficulty to 4 = cannot do it).

Hand-grip Strength. Participants' hand-grip strength was measured as previous studies suggested that hand-grip strength is a reliable indicator of objective physical health in old age (Musalek & Kirchengast, 2017). An electronic hand dynamometer was measured on both hands twice (Bohannon, 2001; Rantanen et al., 1999; Shinkai et al., 2000; Wang et al., 2018). Participants were required to stand and hold the dynamometer with their elbow at a 90° angle in each of his/her hand twice. Both readings of left and right hands were recorded.

3.4.4 Behavioral Risks

This module recorded information on participants' health behaviors, such as smoking, alcohol use, physical activities, healthy eating habits, and various health-promoting behaviors (Chinese version of Health Promoting Lifestyle Profile II; Teng et al., 2010). They were also asked if they had ever delayed receiving medical services in the past year because of the cost of medical treatment (yes or no).

3.4.5 Cognitive Function

Participants' cognitive function was assessed using (1) the Mini Mental State Examination (MMSE; Folstein et al., 1975) and (2) the locally validated Montreal Cognitive Assessment – Chinese (MoCA; Nasreddine et al., 2005). MMSE measured the participants' cognitive function in seven domains, including orientation to time, orientation to place, verbal registration, attention and calculation, verbal recall, language, and visual construction. Possible scores for MMSE range from 0 – 30, with higher scores indicating a higher level of cognitive function. MoCA includes 13 tasks tapping into eight cognitive domains, including visuospatial skills, naming, memory, attention, language, abstraction, delayed recall, and orientation. Participants' total score was calculated by summing all the scores from these 13 tasks.

Possible scores for MoCA range from 0 – 30, with higher scores indicating a higher level of cognitive function.

3.4.6 *Psychological Characteristics and Well-being*

This module assessed participants' psychological attributes, including personality (short form of Big Five Inventory (BFI-S); Lang et al, 2011), perception of future time (Future Time Perspective Scale; Carstensen & Lang, 1996), sense of control (Lachman's Sense of Control Scale; Lachman & Weaver, 1998), resilience (Smith's Brief Resilience Scale-6; Smith et al., 2008), life satisfaction (Satisfaction with Life Scale; Diener, Emmons, Larsen, & Griffin, 1985), affect (International Positive and Negative Affect Scale Short Form; Thompson, 2007), depressive symptoms (Center for Epidemiologic Studies Depression Scale Revised; Björngvinsson et al., 2013), and flourishing (Flourishing Scale; Diener et al., 2010).

Sense of Control. Participants' sense of control was measured by the 12-item Sense of Control Scale (SCS) to assess the individual's sense of control over his or her life (Lachman & Weaver, 1998). The SCS consists of two subscales: personal mastery ("Whether or not I am able to get what I want is in my own hands") and perceived constraints ("Other people determine most of what I can and cannot do"). Participants were asked to rate each item on a 6-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree). Higher scores represent the individual perceives a higher level of sense of control. The Cronbach's alphas of personal mastery and perceived constraints subscales were .79 and .87, respectively.

Future Time Perspective. Participants' perceived time limitation and opportunity was measured by the 10-item Future Time Perspective Scale (Carstensen & Lang, 1996; Fung et al., 2001). A sample item of this scale was "Do you think you will set many new goals in the future?" Participant were asked to rate on the 5-point Likert scale ranging from 1 (definitely not) to 5 (definitely). Two subscales were computed: time limitation and future opportunity, indicating the perceived level of time limitation and time opportunity towards future. Higher scores represent the individuals perceive more open-ended future time. Specifically, the Cronbach's alphas for future time limitation and future time opportunity were .61 and .80, respectively.

Depressive Symptoms. With the 10-item Center for Epidemiologic Studies Depression Scale Revised (CESD-R-10), participants' depression level was assessed. A sample item for this measure was "I was bothered by things that usually don't bother me." Using the rating scale of a 4-point Likert scale (1 = rarely or nearly none to 4 = most of the time), participants were

asked to rate each of the ten items with reference to their experience in the past week. Participants' score for depression was averaged from all answered items, with higher scores indicating more severe levels of depressive symptoms. The Cronbach's alpha was .74 in the current sample.

Life Satisfaction. Participants' level of life satisfaction was measured by the validated five-item Satisfaction with Life scale (SWLS) (Diener et al., 1985). A sample item for this measure was "In most ways my life is close to my ideal." Participants were asked to rate each item on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Participants' score for life satisfaction was averaged from all answered items, with a higher score indicating a more satisfied attitude towards life. The Cronbach's alpha was shown to be .86 in the current sample.

Affect. Participants' level of positive and negative affect was measured with the International Positive and Negative Affect Scale Short Form (Thompson, 2007), which included five positive adjectives (e.g., "inspired") and five negative adjectives (e.g., "upset"). Participants were asked to rate each of the ten items on a 5-point Likert scale ranging from 1 (nearly none) to 5 (a lot) based on their experiences in the past month. An average score was calculated separately for positive and negative affect, with higher scores indicating more intense experiences of the respective affect. The Cronbach's alphas for positive and negative affect were .78 and .81, respectively, in the current sample.

Flourishing. Participants' self-perceived success in the aspects of relationship, self-esteem, purpose, and optimism was measured with the 8-item Flourishing Scale (FS-8) (Diener et al., 2010; Tong & Wang, 2017). A sample item of this scale included "I lead a purposeful and meaningful life." Participants were asked to rate each item with 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). A higher score representing the individual perceived more psychological resources and strengths. The Cronbach's alpha of the flourishing scale was .90.

3.4.7 Healthcare Utilization

This module recorded participants' recent doctor visits and hospitalization in public and private sectors in the past year as well as the medical expenses arising from these doctor visits and hospital stays. Participants also indicated the sources from which their medical expenses were settled (i.e., at one's own expense (including savings), insurance, employer insurance, healthcare voucher, exempted due to the former or current position of civil servant, others).

3.4.8 *Employment and Retirement Planning*

Participants' working status (working full-time/working part-time/self-employed/unemployed/retired/housekeeper) as well as the questions related to their employment, such as employment period, occupation, and work position, was recorded. In addition, if the participants were employed during this study, their levels of job satisfaction and job stress were also measured. Retirement planning was also assessed in this module.

Job Satisfaction. Participants' satisfaction toward their job was adapted from The Generic Job Satisfaction Scale (Macdonald & MacIntyre, 1997). The measure contained 11 items assessing participants' perceived job satisfaction. A sample item for this measure was "I feel good about my job." Participants were asked to rate each item on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). An average score was computed, with higher scores indicating higher satisfaction towards his/her job. The Cronbach's alpha was .86 in the current sample.

Job Stress. Participants' job stress was adapted using the Perceived Stress Scale (Cohen et al., 1983). The scale was originally developed for measuring one's overall stress level, but it has been adapted in the work setting to study job stress (Yeung & Wong, 2020). A sample item for this measure was "In the last month, how often have you felt nervous and stressed in your work?" Participants rated each of the 10 items on a 5-point Likert scale ranging from 1 (none) to 5 (always). Participants' score for job stress was averaged from all answered items, with higher scores indicating greater stress at work. The Cronbach's alpha was .82 in the current sample.

Retirement Preparation. The retirement preparatory activities that participants had carried out were measured using the 20-item locally developed retirement planning scale (Law et al., 2006; Yeung & Zhou, 2017). It contains 20 items covering the four aspects of retirement planning activities, including financial, health, social, and psychological aspects. A sample item for the social retirement preparation was "Developing an interest for the retirement life." For working participants, they were asked to indicate if they have done each of the items (1 = yes and 0 = no), whereas retired participants were asked to indicate if they had done each of the items before their retirement. Participants' score for retirement preparation was summated from all answered items, with higher scores indicating more preparatory work for retirement have been done (Cronbach's alpha = .79). In addition, whether participants were protected by critical illness or health insurance was recorded. In particular, the numbers of critical illness

and health insurance products purchased by the participants were measured. For the participants who had already retired during the interview, they were additionally asked about their actual retirement age and the typical retirement age in their own industry.

3.4.9 The Use of ICT and Intention of Knowledge Update / Skill Update

Participants' use of ICT was assessed in terms of how frequently they engaged in the various forms of ICT. Taking reference from the Hong Kong Smart City Blueprint 2.0 (Hong Kong Innovation and Technology Bureau, 2020), a total of 20 items were designed, which could be grouped into four purposes of ICT use: social, leisure, financial, and medical purposes (Yeung et al., 2023). Sample items for ICT use were "how often do you use social media (e.g., Instagram, Facebook)?" (Social purposes) and "how often do you participate in online gaming?" (Leisure purposes). Participants were requested to rate each item on a 4-point Likert scale ranging from 1 (no knowledge) to 4 (always). Participants' scores for ICT use were averaged from all answered items, with higher score indicating more frequent use of ICT. The Cronbach's alphas for the ICT use in the social, leisure, financial, and medical domains were .71, .88, .89, and .71, respectively, in the current sample.

Moreover, participants' intention to participate in continuous learning programs specifically designed for improving their knowledge and skills in digital technology in the coming year was also assessed. For the participants with positive responses, they were asked to indicate their preferred learning areas or programs (e.g., smart city applications, big data analytics, and artificial intelligence). Participants were also asked to report whether they have previously participated in continuing education or training programs, and knowledge and usage of the Continuing Education Fund (CEF).

3.4.10 Social Support

With reference to Walen and Lachman (2000), participants' level of perceived social support from spouse or partner, child(ren) and close friends were measured. Participants' social engagement, including perceived adequacy of community resources (e.g., community center, social services for the elderly) in their residential district of the participant was also recorded.

3.4.11 Living Arrangement

Participants were also requested to report their current living condition, such as type (private or public housing), size and ownership of their current residence. Furthermore, the

facilities in the living areas, including barrier-free facilities and protective facilities at home was also recorded.

3.4.12 Expectations toward Future

Participants' life expectancy (in years) was also recorded in the current research project. With reference to HRS, participants below the age of 65 were additionally asked how likely they could live up to 75 years old (0 – 100%). Besides, anticipated medical expenses in the upcoming year as well as their anticipation about whether they would be taken care by other people in the long run were recorded.

3.4.13 Participation in Volunteering Activities

Participants' engagement in volunteering activities was also recorded in the current research project. Specifically, participants were asked if they had participated in any volunteering activities in the past 12 months, including instrumental (e.g., food preparation and fundraising) and cognitively demanding (e.g., teaching and befriending) activities. Those who indicated positively were also asked about the frequency and average duration of each volunteering activity.

Due to the wide array of modules in the HKADA database, several modules are not analyzed in the current report, but these modules will be useful for future investigation when the longitudinal data on the respective domains are available.

4. Research Findings

4.1 Demographic Information

4.1.1 Age Groups and Gender

The final sample contained 2391 adults who were aged 45 – 101 years, with mean (M) = 64.15 and standard deviation (SD) = 8.91. Among them, the respective numbers of participants in the following five age subgroups were: 45 to 54 years: $n = 402$ (16.81%); 55 to 64 years: $n = 886$ (37.06%); 65 to 74 years: $n = 849$ (35.51%); 75 to 84 years: $n = 221$ (9.24%); and 85 or above years: $n = 33$ (1.38%). **In the rest of this report, the participants were grouped into two broader age groups: the younger participants refer to those who were aged 45 – 64 years ($n = 1288$, 53.87%) and the older participants refer to those aged 65+**

years ($n = 1103$, 46.13%). The majority of the participants in the final sample ($n = 1671$; 69.89%) were female, with a slightly higher proportion of females in the younger age group of 45 and 64 years (70.81%) than that of the older age group (68.81%). **Exploratory analyses did not show significant differences in the distribution of age, gender, and education level (all $ps > .05$) between the current sample and the Hong Kong population in 2021 (Census and Statistics Department, 2022), implying the representativeness of the sample of HKADA.**

4.1.2 Education Level and Working Status

The education level of participants was recorded. Over 81.26% of the whole sample had completed secondary school education and above, with higher education level among younger participants than their older counterparts [$\chi^2(2) = 348.57, p < .001$]. In particular, 46.81% and 28.27% of younger participants completed post-secondary education and a bachelor's degree or above, respectively, while the respective percentages were 22.71% and 11.99% for older participants.

Regarding the participants' working status, about half of them (62.06%) were retired when taking part in this project. Among younger participants, 32.09% of them were working full-time when they were interviewed, 8.94% of them were working part-time, and 4.04% were self-employed. In comparison, 85.56% of the older participants were retired and only 2.82% of them were working full-time [$\chi^2(5) = 605.18, p < .001$].

4.1.3 Marital Status and Types of Housing

The majority of the participants (58.28%) were married and living with spouses, while 14.14% of the participants had never been married. The proportion of never married was 18.56% for younger participants, which was significantly higher than that of older participants (8.98%; $\chi^2(6) = 221.27, p < .001$). Regarding the type of residence, the majority of the entire sample (68.53%) lived in private housing, with 73.50% of younger participants and 62.73% of older participants. The remaining lived in public housing, with 24.75% of younger participants and 34.88% of older participants [$\chi^2(2) = 32.02, p < .001$].

4.1.4 Distribution across Districts

In this project, the proportions of participants from Hong Kong Island, Kowloon, and the New Territories were 14.09%, 33.88% and 52.03%, respectively. Table 1 shows the percentage of participants by 18 districts. The largest proportion of participants was from Sha

Tin district (10.8%), which is similar to the percentage of the total population (9.4%) reported in the *Population and Household Statistics Analysed by District Council District* (Census and Statistics Department, 2021). The percentages of the remaining participants from Yuen Long and Kwun Tong districts were 9.62% and 9.58%, respectively, which are also comparable to the population distribution reported in the report of Census and Statistics Department (2021). However, the proportion of participants from the Wan Chai district was the smallest, with only 0.88%.

Table 1. Demographic characteristics of the participants by age groups

Age group		<i>n</i> (%)		
		45 – 64 years <i>n</i> = 1288 (53.87)	65+ years <i>n</i> = 1103 (46.13)	Whole sample <i>N</i> = 2391 (100.00)
1. Gender				
	Male	376 (29.19)	344 (31.19)	720 (30.11)
	Female	912 (70.81)	759 (68.81)	1671 (69.89)
2. Education level				
Primary and below	No formal education	6 (0.47)	54 (4.90)	60 (2.52)
	Early childhood education	1 (0.08)	6 (0.54)	7 (0.29)
	Sishu / Home school	2 (0.16)	19 (1.73)	21 (0.88)
	Primary school	65 (5.06)	294 (26.70)	359 (15.05)
	Subtotal	74 (5.76)	373 (33.88)	447 (18.74)
Secondary	Middle school	196 (15.26)	219 (19.89)	415 (17.40)
	High school	413 (32.17)	259 (23.52)	672 (28.18)
	Subtotal	609 (47.43)	478 (43.42)	1087 (45.58)
Post-secondary	Diploma / Certificate course	122 (9.50)	64 (5.81)	186 (7.80)
	Higher or Professional Diploma / Associate Degree	116 (9.03)	54 (4.90)	170 (7.13)
	Bachelor's degree	181 (14.10)	79 (7.18)	260 (10.90)
	Postgraduate Diploma	13 (1.01)	8 (0.73)	21 (0.88)
	Master's degree	161 (12.54)	41 (3.72)	202 (8.47)
	Doctoral degree / Ph.D.	8 (0.62)	4 (0.36)	12 (0.50)
	Subtotal	601 (46.81)	250 (22.71)	851 (35.68)
3. Working status				
	Full-time	413 (32.09)	31 (2.82)	444 (18.59)
	Part-time	115 (8.94)	15 (1.36)	130 (5.44)
	Self-employed	52 (4.04)	3 (0.27)	55 (2.30)
	Unemployed	71 (5.52)	5 (0.45)	76 (3.18)
	Retired	540 (41.96)	942 (85.56)	1482 (62.06)
	Housekeeper	96 (7.46)	105 (9.54)	201 (8.42)
4. Marital status				
	Married and living with spouses	794 (61.65)	599 (54.36)	1393 (58.28)
	Married but not living with spouses	38 (2.95)	36 (3.27)	74 (3.10)
	Separated	8 (0.62)	6 (0.54)	14 (0.59)
	Divorced	144 (11.18)	105 (9.53)	249 (10.42)
	Widowed	53 (4.11)	256 (23.23)	309 (12.93)
	Cohabitated	12 (0.93)	1 (0.09)	13 (0.54)
	Never married	239 (18.56)	99 (8.98)	338 (14.14)

Table 1. Demographic characteristics of the participants by age groups (*cont.*)

Age group		<i>n</i> (%)		
		45 – 64 years <i>n</i> = 1288 (53.87)	65+ years <i>n</i> = 1103 (46.13)	Whole sample <i>N</i> = 2391 (100.00)
5. District				
Hong Kong Island	Central and Western	26 (2.02)	65 (5.89)	91 (3.81)
	Wan Chai	9 (0.70)	12 (1.09)	21 (0.88)
	Eastern	89 (6.91)	69 (6.26)	158 (6.61)
	Southern	33 (2.56)	34 (3.08)	67 (2.80)
	Subtotal	157 (12.19)	180 (16.32)	337 (14.09)
Kowloon	Yau Tsim Mong	57 (4.43)	62 (5.62)	119 (4.98)
	Sham Shui Po	115 (8.93)	66 (5.98)	181 (7.57)
	Kowloon City	73 (5.67)	57 (5.17)	130 (5.44)
	Wong Tai Sin	92 (7.14)	59 (5.35)	151 (6.32)
	Kwun Tong	131 (10.17)	98 (8.88)	229 (9.58)
	Subtotal	468 (36.34)	342 (31.01)	810 (33.88)
New Territories	Kwai Tsing	106 (8.23)	87 (7.89)	193 (8.07)
	Tsuen Wan	50 (3.88)	54 (4.90)	104 (4.35)
	Tuen Mun	61 (4.74)	37 (3.35)	98 (4.10)
	Yuen Long	67 (5.20)	163 (14.78)	230 (9.62)
	North	58 (4.50)	23 (2.09)	81 (3.39)
	Tai Po	59 (4.58)	59 (5.35)	118 (4.94)
	Sha Tin	144 (11.18)	97 (8.79)	241 (10.08)
	Sai Kung	98 (7.61)	38 (3.45)	136 (5.69)
	Islands	20 (1.55)	23 (2.09)	43 (1.80)
	Subtotal	663 (51.48)	581 (52.67)	1244 (52.03)
6. Housing types				
Public	Public Rental Housing	316 (24.63)	384 (34.91)	700 (29.37)
	Interim Housing	0 (0.00)	0 (0.00)	0 (0.00)
	Subtotal	316 (24.63)	384 (34.91)	700 (29.37)
Private	Home Ownership Scheme	241 (18.78)	193 (17.55)	434 (18.21)
	Sandwich Class Housing Scheme	15 (1.17)	3 (0.27)	18 (0.76)
	Private Housing	620 (48.32)	463 (42.09)	1083 (45.45)
	Village House	67 (5.22)	31 (2.82)	98 (4.11)
	Subtotal	943 (73.50)	690 (62.73)	1633 (68.53)
Others		24 (1.87)	26 (2.36)	50 (2.10)

4.2 Socioeconomic Status

The participants' perceived socioeconomic status was measured by the MacArthur Scale of Subjective Social Status (Adler et al., 1994). The participants were asked to indicate their perceived rank relative to others in their group, including the aspects of income, education,

and job prestige. A higher score represents a higher perceived socioeconomic status. Overall, the participants perceived their socioeconomic status in a moderate level ($M = 4.99$, $SD = 1.77$). According to Chen (2012), the scoring of subjective socioeconomic status could be grouped into three subgroups: low subjective socioeconomic status (score 1 – 3), middle subjective socioeconomic status (score 4 – 7), and high socioeconomic status (score 8 – 10). Table 2 displays the results on the socioeconomic status of the current sample by age groups. Majority of the participants (72.30%) in the current sample was categorized to the group of middle subjective socioeconomic status, including 75.21% of younger participants and 68.89% of older participants.

Table 2. Percentage of socioeconomic status groups by age groups

Age group	Socioeconomic status [n (%)]		
	45 – 64 years ($n = 1288$)	65+ years ($n = 1103$)	Whole sample ($N = 2391$)
Low subjective socioeconomic status	245 (19.10)	267 (24.36)	512 (21.52)
Middle subjective socioeconomic status	965 (75.21)	755 (68.89)	1720 (72.30)
High subjective socioeconomic status	73 (5.69)	74 (6.75)	147 (6.18)

4.3 Physical Health

Both subjective and objective physical health were assessed, including their self-perceived physical health, diagnosed chronic diseases, hand-grip strength using an electronic hand dynamometer, and the status of prescribed medications.

4.3.1 Self-perceived Health

All the participants in the current sample were asked to rate their self-perceived physical health, with higher scores indicating better health. The mean score of this item was 3.28 ($SD = .70$), revealing that the participants perceived their physical health as fairly good. Both younger ($M = 3.29$, $SD = .72$) and older participants ($M = 3.26$, $SD = .68$) had similar ratings of their physical health condition. In addition, the participants were also asked to rate their eyesight and hearing abilities (1 = poor to 5 = excellent). On average, the whole sample scored 2.87 ($SD = .99$) for distance vision and 2.84 ($SD = .98$) for close distance. Particularly, the younger participants ($M = 2.95$, $SD = 1.01$) reported better ability of viewing distant objects than their older participants [$M = 2.78$, $SD = .96$; $t(2380) = 4.22$, $p < .001$]. Both younger ($M = 2.85$, $SD = 1.01$) and older ($M = 2.82$, $SD = .96$) participants perceived a similar ability of viewing close objects.

The participants were asked to rate their hearing ability with a 5-point Likert scale (1 = poor to 5 = excellent). Overall, the participants considered they have a fairly good hearing ability ($M = 3.00$, $SD = .96$). In particular, younger participants ($M = 3.13$, $SD = .97$) perceived a better hearing ability than their older counterparts [$M = 2.85$, $SD = .94$; $t(2385) = 7.07$, $p < .001$]. Moreover, 2.14% of the participants reported that they were using hearing aids, including 1.17% of younger participants and 3.27% of older participants.

In addition, whether the participants had experienced any difficulties in performing activities of daily living (ADL) and instrumental activities of daily living (IADL) was also assessed. Overall, both age groups could independently perform most of the daily activities, and only less than 1% and 4% of them had difficulties in performing ADL and IADL.

4.3.2 Hand-grip Strength

The percentage of the dominant hand and the average reading of the dominant hand-grip strength are summarized and presented in Table 3. Majority of the participants (89.87%) were right-handed. Results revealed that the younger participants' hand-grip for their dominant hand was much higher than that of the older participants [Left hand: $t(231) = 2.91$, $p = .004$; Right hand: $t(2059) = 9.09$, $p < .001$]. However, there was no significant difference in hand-grip strength of left-handed and right-handed for the entire sample.

Table 3. Hand-grip strength for both hands by age groups

Age group	Hand-grip strength		
	45 – 64 years ($n = 1288$)	65+ years ($n = 1103$)	Whole sample ($N = 2391$)
	<i>n (%)</i>		
1. Handedness			
Left-handed	106 (8.50)	128 (12.03)	234 (10.13)
Right-handed	1141 (91.50)	936 (87.97)	2077 (89.87)
	<i>M (SD)</i>		
2. Hand-grip strength (kilograms)			
Left-handed	22.86 (8.20) **	19.93 (7.18)	21.25 (7.78)
Right-handed	23.30 (7.75) ***	20.33 (7.03)	21.97 (7.58)

Note. ** Significantly different from the older participants ($p < .01$).

*** Significantly different from the older participants ($p < .001$).

4.3.3 Chronic Diseases

Participants' chronic health condition was one of the important aspects of physical health. Participants in the current project were asked about whether they had been diagnosed with chronic diseases including high blood pressure, dyslipidemia, diabetes or elevated blood sugar, and other 10 types of chronic diseases. The results are summarized in Table 4. Overall, 40.92% of participants did not have any chronic disease. Among them, 51.67% of younger participants and 28.38% of older participants did not have any chronic disease. The percentage of older participants without chronic diseases is similar to the statistics (25.7%) reported in the *Health Status of Hong Kong Residents* (Census and Statistics Department, 2021).

The participants who were diagnosed with chronic diseases were further asked to indicate which kind of disease they had been diagnosed with. In the current sample, the top three chronic illnesses were hypertension (32.80%), high cholesterol (27.28%), and diabetes or elevated blood sugar (14.06%). The percentages of older participants with these chronic diseases were much lower than the statistics reported in the *Thematic Household Survey* by Census and Statistics Department (2021: 67.9% for hypertension, 34.0% for high cholesterol, and 29.8% for diabetes). Specifically, the percentages of high blood pressure for younger and older participants were 22.22% and 45.15%, respectively. The percentages of high cholesterol were 19.43% and 36.45% for younger and older participants, respectively. The percentages of diabetes or elevated blood sugar were 9.71% and 19.13% for younger and older participants, respectively.

4.3.4 Prescribed Medications

The participants were asked if they needed to take prescribed medications regularly and reported the types of prescribed medicines if applicable. The results are summarized in Table 5. Overall, 57.60% of the participants reported taking regular medications. Among those participants who indicated the need of taking prescribed medication regularly, over a half of the participants (56.59%) were taking prescribed medicines to control their blood pressure, including 47.23% of younger participants and 63.40% of older participants. The percentage of taking prescriptions for cholesterol ranked the second, with 38.58% and 53.21% for the younger and older participants, respectively. The third largest proportion of prescriptions was for stomach problems (14.49%), with 12.98% and 15.60% for the younger and older participants, respectively.

Table 4. Diagnosed chronic diseases by age groups

Age group	Diagnosed chronic diseases [n (%)]		
	45 – 64 years (n = 1288)	65+ years (n = 1103)	Whole sample (N = 2391)
1. Number of diagnosed chronic diseases			
None	665 (51.67)	313 (28.38)	978 (40.92)
1	343 (26.65)	293 (26.56)	636 (26.61)
2	151 (11.73)	243 (22.03)	394 (16.49)
3	81 (6.29)	159 (14.42)	240 (10.04)
4	33 (2.56)	69 (6.26)	102 (4.27)
5	12 (0.93)	12 (1.09)	24 (1.00)
6 and above	2 (0.16)	14 (1.27)	16 (0.67)
2. Diagnosed chronic diseases[^]			
Hypertension	286 (22.22)	498 (45.15)	784 (32.80)
High cholesterol	250 (19.43)	402 (36.45)	652 (27.28)
Diabetes or elevated blood sugar	125 (9.71)	211 (19.13)	336 (14.06)
Arthritis or rheumatism	116 (9.01)	142 (12.87)	258 (10.79)
Heart disease	51 (3.96)	128 (11.60)	179 (7.49)
Cancer	65 (5.05)	85 (7.71)	150 (6.28)
Stomach or digestive disease	65 (5.05)	86 (7.80)	151 (6.32)
Liver disease	63 (4.90)	35 (3.17)	98 (4.10)
Asthma	31 (2.41)	17 (1.54)	48 (2.01)
Stroke	8 (0.62)	37 (3.35)	45 (1.88)
Kidney disease	19 (1.48)	23 (2.09)	42 (1.76)
Chronic lung disease	5 (0.39)	12 (1.09)	17 (0.71)
Memory-related disease	8 (0.62)	6 (0.54)	14 (0.59)

Note. [^] Multiple answers were allowed.

Table 5. Percentage of taking regular prescribed medications by age groups

Age group	Prescribed Medications [n (%)] [^]		
	45 – 64 years (n = 580)	65+ years (n = 795)	Total (N = 1375)
Blood pressure ^a	273 (47.23)	504 (63.40)	777 (56.59)
Cholesterol ^a	223 (38.58)	423 (53.21)	646 (47.05)
Stomach problem ^a	75 (12.98)	124 (15.60)	199 (14.49)
Joint or muscle pain ^a	90 (15.60)	96 (12.08)	186 (13.56)
Anxiety or depression ^a	87 (15.08)	61 (7.67)	148 (10.79)
Insomnia ^a	65 (11.27)	60 (7.55)	125 (9.11)
Breathing problem ^a	28 (4.85)	23 (2.89)	51 (3.72)

Note. N = 1375. [^] Multiple answers were allowed.

^a Percentage was only calculated for the participants who had indicated the need of taking regular prescribed medications.

4.4 Behavioral Risks

In the current project, participants' behavioral risks, including their habits of smoking and drinking alcohol, adoption of health-promoting behaviors, and delayed receiving medical services were measured correspondingly.

4.4.1 Smoking and Alcohol Consumption

Smoking and alcohol consumption were assessed in the current project. The results are summarized in Table 6. Overall, 89.99% and 80.54% of the participants had never had any habit of smoking or drinking alcohol, respectively. In terms of smoking behavior, 2.76% of the participants were current smokers, with 3.34% and 2.09% from the younger and older participants, respectively. In terms of alcohol consumption, overall, 11.26% of the participants in the current sample reported having a habit of drinking, with significantly more younger participants (14.61%) indicating drinking habit than older participants (7.35%) [$\chi^2(2) = 31.45$, $p < .001$].

Table 6. Frequency of smoking and alcohol consumption by age groups

Age group	Smoking and alcohol consumption [n (%)]		
	45 – 64 years (<i>n</i> = 1288)	65+ years (<i>n</i> = 1103)	Whole sample (<i>N</i> = 2391)
1. Smoking behavior			
With smoking habit	43 (3.34)	23 (2.09)	66 (2.76)
Currently not	89 (6.92)	84 (7.62)	173 (7.24)
Never smoke	1154 (89.74)	995 (90.29)	2149 (89.99)
2. Alcohol use behavior			
With drinking habit	188 (14.61) ***	81 (7.35)	269 (11.26)
Currently not	99 (7.69)	97 (8.80)	196 (8.20)
Never	1000 (77.70)	924 (83.85)	1924 (80.54)

Note. *** Significantly different from the older participants ($p < .001$).

4.4.2 Health-promoting Behaviors

Participants' health-promoting behaviors were assessed by the validated 30-item Chinese version of Health Promoting Lifestyle Profile II (HPLP-II) (Teng et al., 2010). The Chinese version of HPLP-II contains five dimensions of health-promoting behaviors, including spiritual growth, physical activity, health management, nutrition, and health responsibility. Table 7 summarizes these five behaviors of younger and older participants. In general, the participants indicated that they sometimes conducted health-promoting behaviors ($M = 2.42$,

$SD = .44$). In particular, the older participants ($M = 2.48$, $SD = .46$) performed health-promoting behaviors more frequently than their younger counterparts ($M = 2.36$, $SD = .42$) [$t(2385) = -.66$, $p < .001$].

Significant differences were shown in four out of five dimensions in health-promoting behaviors between younger and older participants. Particularly, older participants carried out significantly more behaviors on the dimensions of physical activity [$M = 2.50$, $SD = .67$; $t(2385) = -9.14$, $p < .001$], health management [$M = 2.46$, $SD = .53$; $t(2384) = -6.76$, $p < .001$] and nutrition [$M = 2.74$, $SD = .51$; $t(2384) = -8.36$, $p < .001$], and conducted more health responsibility behaviors [$M = 2.22$, $SD = .63$; $t(2385) = -2.93$, $p = .003$] than younger participants (physical activity: $M = 2.26$, $SD = .63$; health management: $M = 2.32$, $SD = .47$; nutrition: $M = 2.57$, $SD = .48$; health responsibility: $M = 2.15$, $SD = .53$). No significant difference in the dimension of spiritual growth was observed between younger and older participants.

Table 7. Health-promoting behaviors by age groups

Age group	<i>M (SD)</i>		
	45 – 64 years (<i>n</i> = 1288)	65+ years (<i>n</i> = 1103)	Whole sample (<i>N</i> = 2391)
Health-promoting behaviors (1-4)			
Spiritual growth	2.52 (.63)	2.51 (.67)	2.51 (.65)
Physical activity	2.26 (.63) ***	2.50 (.67)	2.37 (.66)
Health management	2.32 (.47) ***	2.46 (.53)	2.38 (.50)
Nutrition	2.57 (.48) ***	2.74 (.51)	2.64 (.50)
Health responsibility	2.15 (.53) **	2.22 (.63)	2.18 (.58)

Note. ** Significantly different from the older participants ($p < .01$).

*** Significantly different from the older participants ($p < .001$).

4.4.3 Delayed Receiving Medical Services

The participants were also asked if they had delayed receiving medical services in the past year because of the cost of medical treatment. Overall, 10.68% of the participants reported that they had postponed seeking medical treatment in the past year, and the percentages were comparable between the two age groups (10.83% and 10.49%, respectively).

4.5 Cognitive Function

The means and SDs of the MMSE and MoCA scores by age groups are presented in Table 8. Overall, the participants scored 28.7 ($SD = 2.23$) and 25.7 ($SD = 3.67$) for MMSE and MoCA, respectively. Specifically, older participants had lower MMSE scores ($M = 28.1$, $SD = 2.66$) than their younger counterparts [$M = 29.3$, $SD = 1.59$; $t(2379) = 13.48$, $p < .001$]. Similarly, older participants had lower MoCA scores ($M = 24.5$, $SD = 4.29$) than younger participants [$M = 26.8$, $SD = 2.61$; $t(2383) = 16.21$, $p < .001$].

A 23/24 cutoff score in MMSE was adopted to distinguish whether the participants had shown mild cognitive impairment (MCI) or not (Tombaugh et al., 1992). The overall prevalence of MCI was 3.65% in the current sample, with a significantly higher percentage among older participants (7.03%) than among younger participants (0.78%).

In addition to MMSE, MoCA was also assessed as it is a better measure of cognitive function because of more accurate detection of cognitive heterogeneity (Hoops et al., 2009; Jia et al., 2021). Given the well-known influence of age and education level on cognitive functioning (O'Driscoll et al., 2017), different norm-derived age and education adjusted cutoff scores are available in the MoCA, which help to differentiate the participants with MCI from those with intact cognitive functioning (Wong et al., 2009; Wong et al., 2015). For example, for the participants aged 70 – 79 and with over 12 years of education, the cut off score of classifying as having MCI is 20 or below. Similar to the findings of previous studies (Hoops et al., 2009; Jia et al., 2021), the prevalence rate of MCI (10.48%) revealed by MoCA assessment was higher than that of MMSE in the current sample. In particular, 14.86% of participants aged 65 years and above had MCI, which was similar to the prevalence of MCI in previous local studies (e.g., Xu et al., 2020; Yeung et al., 2014).

Table 8. Cognitive functioning by age groups

Age group	<i>n</i>	MMSE		MoCA	
		<i>M (SD)</i>	% of MCI	<i>M (SD)</i>	% of MCI
45 – 64 years	1288	29.3 (1.59) ***	0.78	26.8 (2.61) ***	6.75
65+ years	1103	28.1 (2.66)	7.03	24.5 (4.29)	14.86
<i>Whole sample</i>	2391	28.7 (2.23)	3.65	25.7 (3.67)	10.48

Note. *** Significantly different from the older participants ($p < .001$).

4.6 Psychological Characteristics and Well-being

4.6.1 Psychological Characteristics

Sense of Control

Participants were asked to rate their sense of control over their lives with the 12-item Sense of Control Scale (SCS) (Lachman & Weaver, 1998). Two subscales were measured in the current project: personal mastery and perceived constraints. A higher score of personal mastery and a lower score of perceived constraints represent the individual perceives higher sense of control. Overall, the participants in the current project perceived a moderate level of personal mastery ($M = 3.92$, $SD = .82$) and perceived constraints ($M = 3.38$, $SD = .87$). The levels of personal mastery ($M = 3.90$, $SD = .81$ and $M = 3.94$, $SD = .84$, respectively) and perceived constraints ($M = 3.37$, $SD = .88$ and $M = 3.40$, $SD = .85$, respectively) were not statistically different between younger and older participants [$t(2380) = -1.37$, $p = .172$ and $t(2382) = -.94$, $p = .349$].

Future Time Perspective

Two subscales of future time perspective, perceived time limitation and future opportunities, were investigated. Overall, the participants in the current sample perceived a moderate level of time limitation ($M = 3.42$, $SD = .69$) and future opportunities ($M = 2.90$, $SD = .60$). Specifically, older participants perceived more time limitation ($M = 3.46$, $SD = .68$; $t(2381) = -2.60$, $p = .009$) and fewer future opportunities ($M = 2.83$, $SD = .58$; $t(2382) = 5.55$, $p < .001$) than their younger counterparts ($M = 3.38$, $SD = .70$; $M = 2.96$, $SD = .61$, respectively).

4.6.2 Psychological Well-being

The means and SD s of psychological well-being outcomes are presented in Table 9. In general, the participants experienced a lower level of depressive symptoms, and a moderate level of life satisfaction, positive affect, negative affect, and flourishing.

Table 9. Psychological well-being by age groups

Age group	<i>M (SD)</i>		
	45 – 64 years (<i>n</i> = 1288)	65+ years (<i>n</i> = 1103)	Whole sample (<i>N</i> = 2391)
Depressive symptoms (0 – 30)	8.26 (5.76) **	7.65 (5.37)	7.98 (5.59)
Life satisfaction (1 – 5)	4.35 (1.19) ***	4.74 (1.06)	4.53 (1.15)
Positive affect (1 – 5)	2.96 (.63) ***	2.81 (.73)	2.89 (.68)
Negative affect (1 – 5)	2.30 (.72) ***	2.04 (.68)	2.18 (.72)
Flourishing (1 – 7)	5.03 (.94) ***	5.23 (.86)	5.13 (.91)

Note. ** Significantly different from the older participants ($p < .01$).

*** Significantly different from the older participants ($p < .001$).

Depressive Symptoms.

Depressive symptoms were measured by the 10-item Center for Epidemiologic Studies Depression Scale Revised (CESD-R-10) (Andresen et al., 1994). A higher score indicates more severe depressive symptoms. The participants were asked to indicate how often they have felt during the past one week. Overall, the participants in the current sample should be at the level of minimal depression ($M = 7.98$, $SD = 5.59$). To distinguish the individuals with depression, a cutoff score of 10 was adopted (Andresen et al., 1994; Fu et al., 2022). In the current sample, there were 34.45% of the participants who scored 10 or above, showing signs of depression. This percentage is comparable to the prevalence rate reported in the previous studies (Chang & Jhang, 2021; Liang et al., 2021). In addition, the younger participants ($M = 8.26$, $SD = 5.76$) experienced relatively more depressive symptoms than their older counterparts ($M = 7.65$, $SD = 5.37$) [$t(2381) = 2.68$, $p = .007$].

Life Satisfaction.

The 5-item Satisfaction with Life scale (SWLS) (Diener et al., 1985) was adopted to measure participants' level of life satisfaction. A higher score indicates a higher level of life satisfaction. In general, the participants in the current sample perceived a moderate level of life satisfaction ($M = 4.53$, $SD = 1.15$), which was similar to the previous study investigating life satisfaction among older Hong Kong adults (Au et al., 2020). Compared with younger participants ($M = 4.35$, $SD = 1.19$), older participants reported higher levels of life satisfaction [$M = 4.74$, $SD = 1.06$, $t(2384) = -8.36$, $p < .001$].

Positive Affect and Negative Affect.

Positive affect and negative affect were measured with the 10-item International Positive and Negative Affect Scale Short Form (IPNASSF) (Thompson, 2007). The participants were asked to indicate to what extent they have felt with 10 different feelings during the past one month. Overall, the participants rated a moderate level of both positive affect ($M = 2.89$, $SD = .68$) and negative affect ($M = 2.18$, $SD = .72$). In the current sample, younger participants reported more positive and negative emotions ($M = 2.96$, $SD = .63$, $t(2384) = 5.37$, $p < .001$; and $M = 2.30$, $SD = .72$, $t(2385) = 9.09$, $p < .001$, respectively) than older participants ($M = 2.81$, $SD = .73$, and $M = 2.04$, $SD = .68$, respectively) in the past month.

Flourishing

Flourishing was assessed by the 8-item Flourishing Scale (FS-8) (Tong & Wang, 2017). A higher score represents a higher level of the participant's self-perceived success in the aspects of relationship, self-esteem, purpose, and optimism (Diener et al., 2010). In general, the participants in the current sample indicated a moderate level of flourishing ($M = 5.13$, $SD = .91$), which is similar to the findings reported in previous studies on flourishing (Tang et al., 2016; Tong & Wang, 2017). In the current sample, older participants perceived a higher level of flourishing ($M = 5.23$, $SD = .86$) relative to their younger counterparts [$(M = 5.03$, $SD = .94$), $t(2381) = -5.43$, $p < .001$].

4.7 Healthcare Utilization

In the module of health utilization, the participants' utilization of outpatient services and hospitalization, as well as their sources of payment for the medical and health services were measured.

4.7.1 Outpatient Services and Hospitalization

The participants' utilization of healthcare services in the past year was recorded and are summarized in Table 10. Overall, 81.76% of the participants had used outpatient services and 12.06% of them were hospitalized in the past year. The older participants were more likely to seek for outpatient and hospital services in the public sector, as compared with the younger participants. For example, 65.70% of younger participants and 78.47% of older participants used services in public clinics. Moreover, more younger participants (42.87%) used private clinics than their older counterparts (31.20%). For those who were hospitalized, only 8% of

older participants received services from private hospitals whereas the percentage of younger participants was substantially higher (27.41%).

Table 10. Percentage of health services utilization in the past one year by age groups

Age group	Health services utilization (%)		
	45 – 64 years (<i>n</i> = 1288)	65+ years (<i>n</i> = 1103)	Whole sample (<i>N</i> = 2391)
1. Outpatient services [^]	78.24	85.86	81.76
Public clinic ^a	65.70	78.47	71.75
Public Chinese medicine clinic ^a	6.77	8.19	7.45
Private clinic ^a	42.87	31.20	37.29
Private Chinese medicine clinic ^a	19.96	18.53	19.27
Accident and emergency ^a	4.77	5.24	4.99
Others ^a	2.98	1.81	2.42
2. Hospitalization [^]	10.57	13.79	12.06
Public hospital ^b	72.59	92.00	82.81
Private hospital ^b	27.41	8.00	17.19

Note. [^] Multiple answers were allowed.

^a *N* = 1954, including 1007 younger participants and 947 older participants. Percentage was calculated for those who had utilized in health services.

^b *N* = 288, including 136 younger participants and 152 older participants. Only those who had been hospitalized were included for the calculation.

4.7.2 Sources of Payment for Health Services

The sources of payment for health services were measured and the findings are summarized in Table 11. Overall, 66.79% and 63.82% of the participants paid their outpatient services and hospitalization, respectively, with their savings. Specifically, the majority of the younger participants usually paid their bills for outpatient services with their savings (73.86%) and 10.13% of them relied on the company insurance coverage for outpatient services. Among older participants, they mainly paid their outpatient services with their savings (58.99%) and Health Care Voucher (31.99%). For the hospitalization services, younger participants tend to use their personal insurance (17.19%) to a greater extent than their older counterparts (4.35%).

In the current sample, there were 45.14% and 72.14% of younger and older participants, respectively, reported taking prescribed medications regularly. On average, nearly a half of the participants (49.88%) paid their prescriptions with their savings.

Table 11. Percentage of payment sources for health services by age groups

Age group	Source of payment for health services (%)		
	45 – 64 years (<i>n</i> = 1288)	65+ years (<i>n</i> = 1103)	Whole sample (<i>N</i> = 2391)
1. For outpatient services^{^a}			
Savings	73.86	58.99	66.79
Personal insurance	4.83	1.08	3.02
Company insurance	10.13	0.54	5.44
Health Care Voucher ^b	– ^b	31.99	14.40
Others	7.58	10.42	9.02
2. For hospitalization^{^a}			
Savings	65.87	61.67	63.82
Personal insurance	17.19	4.35	10.53
Company insurance	11.90	0.00	5.62
Others	6.28	10.80	8.59
3. For prescribed medications^{^a}			
Savings	56.49	45.01	49.88
Personal insurance	0.54	0.26	0.38
Company insurance	1.47	0.13	0.68
Health Care Voucher ^b	–	1.60	0.92
Others	17.91	19.36	18.74

Note. [^] Multiple answers were allowed.

^a Percentage was calculated for the participants who had utilized outpatient or hospitalization services in the past year, and those who took regular prescribed medications. *Ns* were 1954 for outpatient services, 288 for hospitalization, and 1375 for prescribed medications, respectively; *ns* were ranging from 136 to 1007 for younger and older participants.

^b Only adults aged 65 years and above are eligible for the Health Care Voucher Scheme, therefore, the percentage is not available for adults aged below 65.

4.8 Health-related Insurance

When the participants were asked if they had purchased health-related insurance products, the majority of participants indicated that they did not purchase any critical illness (73.9%) or health (65.2%) insurance products. More than a half of the participants did not have one of these two insurance products (57.7%). The younger participants seemed to own relatively more health-related insurance products than the older participants. Specifically, 58.8% of younger participants had at least one critical illness insurance or health insurance products, which was higher than older participants (23.1%). Table 12 displays the purchase of these health-related insurance products of these two age groups of participants.

Table 12. The purchase of health-related insurance products by age groups

Age group	Purchase of Health-related Insurance Products (%)					
	45 – 64 years (<i>n</i> = 1288)		65+ years (<i>n</i> = 1103)		Whole sample (<i>N</i> = 2391)	
	None	At least 1	None	At least 1	None	At least 1
Critical illness insurance	59.9	40.1	90.2	9.8	73.9	26.1
Health insurance	52.6	47.4	79.7	20.3	65.2	34.8
Critical illness and health insurances combined	41.1	58.8	76.9	23.1	57.7	42.4

4.9 Employment and Retirement Preparation

Table 13 summarizes the working status of these two age groups of participants. The majority of the participants (62%) were retired. The rest of the participants were working full-time (18.6%) or part-time (5.4%), housekeepers (8.4%), unemployed (3.2%) or self-employed (2.3%).

Among younger participants, 41.9% of them were retired and 32.1% were working full-time when they were interviewed. The rest of these participants were working part-time (8.9%), housekeepers (7.5%), unemployed (5.5%), and self-employed (4.0%). On the contrary, 85.4% of older participants were retired, with the remaining being a housekeeper (9.5%), working part-time (1.4%), working full-time (2.8%), unemployed (0.5%), or self-employed (0.3%).

Table 13. The working status by age groups

Age group	Working status [n (%)]		
	45 – 64 years (<i>n</i> = 1288)	65+ years (<i>n</i> = 1103)	Whole sample (<i>N</i> = 2391)
Full-time	413 (32.1)	31 (2.8)	444 (18.6)
Part-time	115 (8.9)	15 (1.4)	130 (5.4)
Self-employed	52 (4.0)	3 (0.3)	55 (2.3)
Unemployed	71 (5.5)	5 (0.5)	76 (3.2)
Retired	540 (41.9)	942 (85.4)	1482 (62)
Housekeeper	96 (7.5)	105 (9.5)	201 (8.4)
Subtotal	1287 (99.9)	1101 (99.8)	2389 (99.9)

4.9.1 Job Satisfaction and Job Stress

Among the participants who were working, further analyses regarding their job satisfaction and job stress were performed. Participants were satisfied with their work, having a mean score of 3.60 out of 5 in the whole sample. Overall, participants experienced mild to moderate level of stress at work, with a mean score of 2.42 out of 5 in the whole sample. The

participants in older age group, however, had less stress at work than participants in younger age group. Taken together, it is found that older participants held a more positive attitudes towards workplace than their younger counterparts. Table 14 displays the mean scores of job satisfaction and job stress of these two age groups of participants.

Table 14. The levels of job satisfaction and job stress by age groups

Age group	<i>M (SD)</i>		
	45 – 64 years (<i>n</i> = 580)	65+ years (<i>n</i> = 49)	Total (<i>N</i> = 629)
Job satisfaction (1-5)	3.59 (.58)	3.71 (.63)	3.60 (.59)
Job stress (1-5)	2.44 (.60)**	2.15 (.68)	2.42 (.61)

Note. *N* = 629.

** Significantly different from the older participants ($p < .01$).

4.9.2 Retirement Age

For the retired individuals in the current sample, the majority of them retired at an early than the typical retirement age in their own industries (47.4%), with the remaining of them retired at the same age as the typical retirement age in their industries (32.8%), or retired at a later age (19.8%). For those who retired earlier than the typical retirement age in their industries, they retired on average 8.08 years earlier. For those who retired later than the typical retirement age, they retired on average 2.9 years later. The distributions of gender, education level, and work position within each retirement type are summarized in Table 15.

Table 15. The distribution of retirement types by gender, education level, and work position

	Retirement Type (%)		
	Early (<i>n</i> = 502)	On Time (<i>n</i> = 347)	Later (<i>n</i> = 210)
1. Gender			
Male	27.3	42.1	39.5
Female	72.7	57.9	60.5
2. Education level			
Primary and below	14.1	16.7	18.6
Secondary	44.6	47.3	44.3
Post-secondary	41.2	36.0	37.1
3. Work position			
Managerial or professional	40.6	36.9	40
Others	59.4	63.1	60

Note. *N* = 1482.

4.9.3 Retirement Preparation

Participants in the current sample were grouped into working and non-working subgroups (being retired, unemployed, or housekeeping individuals) to compare their degrees of preparation for retirement. Table 16 summarizes the retirement planning activities of working and non-working participants. On average, each participant performed only 8.17 out of 20 preparatory activities. Results revealed that currently working participants ($M = 8.68$) performed more retirement preparatory activities than non-working participants ($M = 7.99$) in general [$t(1169) = 3.66, p < .001$].

Statistical analyses revealed that working participants had done more preparatory planning in the financial ($M = 2.47$) domain than non-working participants ($M = 1.68$), with p -value being $<.001$. However, surprisingly, currently working participants ($M = 2.45$) seemed to have prepared less psychologically compared with non-working participants ($M = 2.64$), even though such discrepancy did not reach a statistically significant level.

Table 16. The retirement planning activities by work status

Work status	<i>M (SD)</i>		
	Working (<i>n</i> = 629)	Non-working (<i>n</i> = 1759)	Whole sample (<i>N</i> = 2391)
Financial planning (0 – 5)	2.47*** (1.48)	1.68 (1.48)	1.89 (1.52)
Health planning (0 – 4)	2.23 (1.13)	2.15 (1.08)	2.17 (1.10)
Social planning (0 – 4)	1.53 (1.11)	1.52 (1.12)	1.52 (1.12)
Psychological planning (0 – 7)	2.45 (2.02)	2.64 (2.17)	2.59 (2.13)
Overall planning (0 – 20)	8.68*** (4.00)	7.99 (4.24)	8.17 (4.19)

Note. ***Significantly different from non-working participants ($p < .001$).

4.10 Expectations toward Future

4.10.1 Life Expectancy

All participants were asked about their life expectancy and the results are summarized in Table 17. Overall, 51.12% of the participants expected that they could live up to 71 to 80 years. Among the younger participants, more than half of them (54.04%) expected they could live up to 71 to 80 years. On the other hand, 46.39% of older participants expected that they could live up to 71 to 80 years. A comparable proportion of them (42.64%) expected that they could live up to 81 to 90 years.

In addition, for the participants who aged below 65 years were asked their likelihood of living up to 75 years and above. Most of the participants reported that they had a chance of living up to age 75 ($M = 73.00\%$, $SD = 23.08$).

Table 17. Life expectancy by age groups

Age group	<i>n</i> (%)		Whole sample (<i>N</i> =2391)
	45 – 64 years (<i>n</i> = 1288)	65+ years (<i>n</i> = 1103)	
Life expectancy (years)			
Below 70	223 (19.19)	20 (2.78)	243 (12.91)
71 – 80	628 (54.04)	334 (46.39)	962 (51.12)
81 – 90	271 (23.32)	307 (42.64)	578 (30.71)
Above 91	40 (3.44)	59 (8.19)	99 (5.26)

4.10.2 Expected Medical Expenditure

All participants were asked to report their expected medical expenditure for the coming year and the results are summarized in Table 18. In general, 50.93% of the participants expected that they might spend less than HKD3,000 for medical purposes in the upcoming year. Significant difference in expected medical expenditure was found between the two age groups [$\chi^2(3) = 16.25$, $p = .001$]. In particular, over 55% of older participants expected their medical expenditure to be less than HKD3,000 than their younger counterparts (47.40%). In addition, more than one fifth of younger participants (24.16%) and older participants (21.79%) reported that the medical expenditure was estimated to be more than HKD10,000 in the coming year.

Table 18. Expected medical expenditure by age groups

Age group	<i>n</i> (%)		Whole sample (<i>N</i> =2391)
	45 – 64 years (<i>n</i> = 1288)	65+ years (<i>n</i> = 1103)	
Amount (HKD)			
Below 3,000	520 (47.40)	415 (56.16)	935 (50.93)
3,001 – 6,000	128 (11.67)	77 (10.42)	205 (11.17)
6,001 – 10,000	184 (16.77)	86 (11.64)	270 (14.71)
Above 10,001	265 (24.16)	161 (21.79)	426 (23.20)

4.10.3 Expected Likelihood of Institutionalization

For those participants aged 65 years and above, they were asked the expected chance to be institutionalized in coming five years and the results are summarized in Table 19. The majority of them (78.13%) expected less than 25% chance for institutionalization.

Table 19. Expected chance to be institutionalized in the coming five years among those aged 65 years and above

Likelihood (%)	%
0 – 25	78.13
26 – 50	15.99
51 – 75	2.28
76 – 100	3.60

Note. $N = 832$.

4.10.4 Expected Likelihood of Losing the Job in the Coming Year

The working participants were asked to indicate their expected likelihood of losing their job in the coming year, and the results are summarized in Table 20. The majority of working adults (68.87%) indicated that their expected likelihood of losing their job in the coming year might be less than 25%. A similar percentage of losing a job in the coming year was found between younger (68.68%) and older working participants (71.11%).

Table 20. Expected likelihood of losing job in the coming year by age groups

Age group	<i>n</i> (%)		Total ($N = 705$)
	45-64 years ($n = 651$)	65+ years ($n = 54$)	
Likelihood (%)			
0 – 25	375 (68.68)	32 (71.11)	407 (68.87)
26 – 50	109 (19.96)	9 (20.00)	118 (19.97)
51 – 75	17 (3.11)	1 (2.22)	18 (3.05)
76 – 100	45 (8.24)	3 (6.67)	48 (8.12)

Note. $N = 705$.

4.10.5 Expected Age to Retire

The working participants also were asked about their expected age to retire. The results are summarized in Table 21. In general, 71.89% of working adults indicated that they might retire at the age of 56 to 65. Among the younger working adults, 75.95% of them indicated that they might retire when reaching the age of 56 to 65 years. However, 82.35% of the older working adults considered retiring from their workplace after reaching 66 to 75 years.

Table 21. Expected age to retire

Age	<i>n</i> (%)		
	45-64 years (<i>n</i> = 651)	65+ years (<i>n</i> = 54)	Total (<i>N</i> = 705)
Expected retirement age (years)			
Below 55	44 (7.96)	0 (0.00)	44 (7.50)
56 – 65	420 (75.95)	2 (5.88)	422 (71.89)
66 – 75	80 (14.47)	28 (82.35)	108 (18.40)
76 – 85	7 (1.27)	4 (11.76)	11 (1.87)
Above 86	2 (0.36)	0 (0.00)	2 (0.34)

Note. *N* = 705.

4.10.6 Intention to Work beyond Typical Retirement Age

The participants who were still working were asked about their tendency to work beyond their typical retirement age. In general, over half of the working participants (50.51%) considered working even after they reached retirement age. Specifically, 50.95% of the younger working adults and 45.10% of older working adults indicated that they might work beyond the typical retirement age. On the contrary, the result also indicated that over a quarter of participant (23.49%) considered that they would not work beyond their typical retirement age. In particular, 23.33% of the younger participants and 25.49% of the older participants mentioned that it would be unlikely for them to work after the typical retirement age. Table 22 displays the results on the intention to work beyond typical retirement age.

Table 22. Intention to work beyond typical retirement age by age groups

Age Group	Tendency to work beyond typical retirement age [<i>n</i> (%)]		
	45-64 years (<i>n</i> = 651)	65+ years (<i>n</i> = 54)	Total (<i>n</i> = 705)
Definitely not	61 (9.68)	6 (11.76)	67 (9.84)
Might not	147 (23.33)	13 (25.49)	160 (23.49)
Might	321 (50.95)	23 (45.10)	344 (50.51)
Definitely yes	101 (16.03)	9 (17.65)	110 (16.15)

Note. *N* = 705.

4.10.7 Intention to Work for Pay after Age 70

Participants aged 65 to 69 years were asked their likelihood of working for pay after age 70. The results are summarized in Table 23. The result revealed that majority of the participants (87.41%) in this age range indicated that they would have less than 25% of chance to work for pay after age 70.

Table 23. Expected likelihood of working for pay after age 70 years

Likelihood (%)	%
0 – 25	87.41
26 – 50	6.76
51 – 75	1.86
76 – 100	3.96

Note. $N = 429$.

4.11 The Use of ICT and Intention of Knowledge Update / Skill Update

Participants in the current sample adopted ICT to a different extent, depending on the purpose of the ICT use. For the ICT use for social purposes, the majority of participants indicated that they often engaged in various types of ICT use for social purposes (e.g., email [47.6%], instant messengers [87.5%], and social media [49.3%]). One exception being the use of video call, with most of the participants indicated that they almost never used it (34.1%). The frequency of ICT use for leisure purposes varied by each specific activity. For example, within the ICT use for leisure purposes, most of the participants indicated that they often read online (46.2%), and search information (56.3%). However, it was also observed that most participants had no knowledge on booking travelling-related products online (36.7%). Participants also engaged in little ICT use for financial purposes, with the majority of the participants indicated that they had no knowledge on these activities, including online shopping (32.5%), online selling (49.2%), online banking (32.6%), online investment (38.4%), and mobile payment (35%). Similarly, most of the participants indicated that they had no knowledge on any of the ICT use for medical purposes, including online medical appointment (31.9%), video consultation (58.0%), and online consultation (59.6%).

The use of ICT was also compared between the two age groups. The most notable age differences lie in the ICT use for leisure and financial purposes. Similar to the overall trend, majority of the younger participants indicated that they often used most of the ICT use for leisure purposes, including reading (54.3%), maps (47.9%), transportation (55.1%), information searching (71.4%), and online workshop (29.8%).

In contrast, majority of the older participants indicated that they had no knowledge on most of the ICT use for leisure purposes, including travel booking (57.5%), online reservation (42.2%), online gaming (46.5%), maps (35.4%), and online workshop (41.2%). Similar age difference was observed for the ICT use for financial purpose. While the majority of the younger participants often used ICT for most of the finance-related activities, such as online

banking (46.1%) and mobile payment (41.1%), most older participants had no knowledge on all finance-related ICT use, including online shopping (52.4%), online selling (65.4%), online banking (52.7%), online investment (56.8%), and mobile payment (55.1%). Table 24 summarizes the frequency of ICT use for various purposes by age groups.

For the intention to advance technological knowledge, 953 participants (40%) indicated that they had participated in continuing education programs. The proportion of participants with participation in continuing education seemed to be higher among younger participants ($n = 635$; 49.3%) than their older counterparts ($n = 318$; 28.8%). The types of the continuing education programs were diverse, including but not limited to academic degree courses (e.g., doctoral degree programs), leisure and interest classes (e.g., photography classes, flower-arranging classes, cooking classes), courses with the focus of knowledge advancement (e.g., occupational safety, use of ICT), and courses with practical purposes (e.g., plumbing courses).

However, when they were asked about whether they would still participate in an ICT related continuing education program in the coming year, a substantial number of participants indicated that they would join or definitely join (51.4%) such program in the coming year. The intention to participate in an ICT-related continuing education program was higher for younger participants, with the majority of them indicating that they would join or definitely join such program (57.2%). In comparison, a smaller proportion of older participants indicated that they would join or definitely join such program (44.6%). Table 25 summarizes the tendency to participate in an ICT-related continuing education program of these two age groups of participants.

Table 24. Frequency of ICT use by age groups

Age group	Frequency of ICT Use (%)											
	45-64 years (<i>n</i> = 1288)				65+ years (<i>n</i> = 1103)				Whole sample (<i>n</i> = 2391)			
	No knowledge	Almost never	Sometimes	Often	No knowledge	Almost never	Sometimes	Often	No knowledge	Almost never	Sometimes	Often
1. Social												
Email	6.3	11.8	20.0	61.9	30.5	20.1	16.4	29.0	17.8	15.9	18.7	47.6
Video call	5.1	35.9	30.6	28.4	16.5	31.9	31.9	19.6	10.2	34.1	31.2	24.4
Messenger	.2	1.5	5.0	93.4	7.2	4.1	8.3	80.5	3.3	2.6	6.5	87.5
Social media	6.1	15.6	18.0	60.4	25.1	21.9	17.1	35.9	14.7	18.4	17.6	49.3
2. Leisure Activity												
Reading	5.4	14.3	26.0	54.3	21.3	20.2	22.2	36.3	12.6	17.9	24.3	46.2
Travel booking	19.7	34.5	28.9	17.0	57.5	29.5	7.6	5.4	36.7	32.2	19.3	11.8
Online reservation	9.4	18.7	40.6	31.3	42.2	22.0	24.6	11.1	24.2	20.2	33.4	22.2
Online gaming	28.9	43.9	14.2	13.0	46.5	34.1	9.6	9.8	36.8	39.5	12.2	11.6
Maps	9.5	12.7	29.9	47.9	35.4	17.9	25.5	21.2	21.2	15.1	27.9	35.8
Transportation	6.8	13.1	24.9	55.1	27.2	12.8	23.9	36.1	16.0	13.0	24.5	46.6
Information searching	3.6	4.1	20.9	71.4	27.8	11.9	22.3	37.9	14.5	7.6	21.6	56.3
Online workshop	13.2	27.6	29.4	29.8	41.2	28.0	18.4	11.7	25.8	28.1	24.4	21.6
3. Financial												
Online shopping	16.2	30.6	29.8	23.4	52.4	29.2	11.1	7.4	32.5	30.0	21.3	16.2
Online selling	35.8	45.1	11.6	7.5	65.4	29.9	3.2	1.4	49.2	38.2	7.8	4.7
Banking	16.0	15.7	22.2	46.1	52.7	18.7	11.2	17.4	32.6	17.1	17.2	33.1
Investment	23.3	30.8	20.4	25.4	56.8	24.3	10.0	9.0	38.4	27.9	15.7	18.0
Mobile payment	18.4	17.8	22.6	41.1	55.1	22.1	11.0	11.7	35.0	19.7	17.4	27.8
4. Medical												
Medical appointment	19.1	34.6	28.4	18.0	47.5	24.9	19.7	7.9	31.9	30.2	24.5	13.4
Video consultation	49.9	46.1	2.4	1.6	67.9	30.0	1.8	.4	58.0	38.8	2.1	1.1
Online consultation	51.3	45.4	2.1	1.2	69.7	29.1	1.1	.1	59.6	38.1	1.7	.7

Table 25. Tendency to participate in an ICT-related continuing education program by age groups

Age group	Tendency to participate in an ICT-related continuing education program in the coming year (%)		
	45 – 64 years (<i>n</i> = 1288)	65+ years (<i>n</i> = 1103)	Whole sample (<i>N</i> = 2391)
Would definitely not join	329 (25.6)	458 (41.9)	787 (33.1)
Would not join	221 (17.2)	148 (13.5)	369 (15.5)
Would join	486 (37.8)	309 (28.3)	795 (33.4)
Would definitely join	249 (19.4)	178 (16.3)	427 (18.0)

4.12 Social Support

Participants in the current project were asked about their perceived social support from their spouse or partner, child(ren), and/ or close friends. They were also asked to rate their relationship with spouse/ partner on relation closeness, the enjoyment that time spent with their spouse/ partner, and whether they would spend spare time to do things with their spouse/ partner. In addition, the support from the community also plays an important role in social support. Therefore, participants' perceived adequacy of community resources was also included in this section.

4.12.1 Perceived Social Support

Table 26 summarizes the perceived social support from spouse/ partner, child(ren), and close friends. Overall, all the participants in the current sample perceived moderated level of social support (Spouse/ partner: $M = 2.99$, $SD = .81$; Child(ren): $M = 2.74$, $SD = .78$; Close friends: $M = 2.50$, $SD = .75$), but at the same time, they also perceived a mediocre level of strain in their relationship with their spouse/ partner ($M = 2.29$, $SD = .70$), child(ren) ($M = 2.01$, $SD = .67$), and close friends ($M = 1.67$, $SD = .56$). Statistical analyses revealed that the older participants were more likely to perceive a higher level of support from their child(ren), a lower level of support from their spouse / partner and close friends, as well as a lower level of strain from their spouse/ partner, child(ren), and close friends, than their younger counterparts.

Table 26. Perceived social support by age groups

Age group	<i>M (SD)</i>		
	45 – 64 years (<i>n</i> = 1288)	65+ years (<i>n</i> = 1103)	Whole sample (<i>N</i> =2391)
1. Spouse/ partner's support^a			
Perceived support (1 – 4)	3.03 (.77) *	2.94 (.85)	2.99 (.81)
Perceived strain (1 – 4)	2.35 (.69) ***	2.20 (.72)	2.29 (.70)
2. Child(ren)'s support^a			
Perceived support (1 – 4)	2.62 (.78) ***	2.85 (.77)	2.74 (.78)
Perceived strain (1 – 4)	2.20 (.67) ***	1.84 (.63)	2.01 (.67)
3. Close friends' support			
Perceived support (1 – 4)	2.57 (.75) ***	2.41 (.73)	2.50 (.75)
Perceived strain (1 – 4)	1.75 (.57) ***	1.58 (.54)	1.67 (.56)

Note. ^a Only the participants who were married/had an intimate partner and/or child(ren) were included for these analyses. *Ns* were ranged from 1471 to 2155 for the whole sample, including the range of 628 – 1174 for younger and older participants.

* Significantly different from the older participants ($p < .05$).

*** Significantly different from the older participants ($p < .001$).

4.12.2 Relationship with Spouse / Intimate Partner

The participants who were in spousal or partnership were further asked about their relationship with their spouse or intimate partner. The results are presented in Table 27. In general, 39.10% of the participants indicated that they maintained quite a close relationship with their spouse/ intimate partner. Specifically, 41.25% and 36.22% of younger and older participants, respectively, considered the relationship closeness with their partner was quite close. For the enjoyment of time spent with their partner, 40.35% of the participants rated “very enjoyable”, which included 41.32% of younger participants and 39.06% of older participants. Lastly, the result showed that most of the participants (50.24%) indicated that they would spare time to do things together with their spouse/ partner, including 52.13% of younger participants and 47.71% of older participants.

Table 27. Relationship with spouse/ intimate partner by age groups

Age group	Relationship with spouse/ intimate partner [n (%)]		
	45 – 64 years (n = 847)	65+ years (n = 635)	Total (N = 1482)
1. Relationship Closeness^a			
Very close	224 (26.48)	176 (27.72)	400 (27.00)
Quite close	349 (41.25)	230 (36.22)	579 (39.10)
Not very close	183 (21.63)	158 (24.88)	341 (23.02)
Not at all close	90 (10.64)	71 (11.18)	161 (10.87)
2. Enjoyment^a			
Extremely enjoyable	143 (16.88)	114 (17.95)	257 (17.34)
Very enjoyable	350 (41.32)	248 (39.06)	598 (40.35)
Somewhat enjoyable	268 (31.64)	203 (31.97)	471 (31.78)
Not too enjoyable	86 (10.15)	70 (11.02)	156 (10.53)
3. Do things with spouse/ partner^a			
Most or all together	253 (29.91)	213 (33.65)	466 (31.51)
Some together, some separately	441 (52.13)	302 (47.71)	743 (50.24)
Most or all separately	152 (17.97)	118 (18.64)	270 (18.26)

Note. N = 1482. ^a Only the participants who were married/had an intimate partner were included in the analyses.

4.12.3 Perceived Adequacy of Community Resources

Social support from the living community was assessed in this project. All the participants in the current sample rated the perceived adequacy of community resources in their residential area, such as community centers, community care and support services for the elderly. Participants' perceived need and sufficiency of the community resources in their residential areas were the indicators for assessing their perceived adequacy of community resources. Overall, the majority of the participants (62.21%) considered that the community resources were sufficient in their residential areas. Furthermore, according to the results presented in Table 28, the insufficient community resources being indicated by the participants were rehabilitation centers (23.24%) and children & adolescent centers (36.50%). Remarkably, both younger and older participants showed similar needs on increasing medical resources in their neighborhoods, such as Chinese medicine clinics (62.31%), medical practitioner clinics (78.51%), and hospitals (78.79%). Moreover, the participants also mentioned their demands on sports & recreational centers (75.19%). Compared with younger counterparts, a higher proportion of older participants raised their needs of increasing community

centers (68.80%) and community care and support services for the elderly (66.20%). On the contrary, the younger participants reported greater needs for children and adolescent centers (22.14%) and sports and recreational centers (77.25%) than the older participants (18.12% and 72.74%, respectively).

Table 28. Perceived adequacy of community resources by age groups

Age group	Perceived adequacy of community resources [n (%)]					
	45 – 64 years (n = 1288)		65+ years (n = 1103)		Whole sample (N =2391)	
	Sufficiency	Perceived Need	Sufficiency	Perceived Need	Sufficiency	Perceived Need
Community centers	670 (52.22)	599 (46.91)	680 (62.27)	743 (68.80)	1350 (56.84)	1342 (56.94)
Community care and support services for the elderly	566 (44.43)	434 (33.99)	622 (57.06)	713 (66.20)	1188 (50.25)	1147 (48.73)
Children & adolescent centers	546 (42.72)	282 (22.14)	315 (29.14)	195 (18.12)	861 (36.50)	477 (20.30)
Religious organizations	737 (57.85)	459 (35.97)	583 (53.83)	393 (36.56)	1320 (56.00)	852 (36.24)
Chinese medicine clinics	812 (63.34)	767 (59.92)	667 (61.14)	701 (65.15)	1479 (62.33)	1468 (62.31)
Medical practitioner clinics	1022 (79.53)	992 (77.44)	862 (78.72)	860 (79.78)	1884 (79.16)	1852 (78.51)
Hospitals	782 (60.76)	962 (75.16)	637 (58.23)	895 (83.10)	1419 (59.60)	1857 (78.79)
Rehabilitation centers	291 (22.81)	452 (35.34)	258 (23.76)	442 (41.15)	549 (23.24)	894 (37.99)
Sports & recreational centers	838 (65.11)	988 (77.25)	648 (59.18)	782 (72.74)	1486 (62.38)	1770 (75.19)

4.13 Facilities in Residential Areas

4.13.1 Barrier-free Facilities

An accessible barrier-free environment is significant for the elderly and the people with disabilities to facilitate in community life. In the current project, participants were asked to report whether their residential areas provided barrier-free facilities. The results are presented in Table 29. Overall, 58.68% of the participants mentioned that their housing estates provided barrier-free facilities, with the ramp and the tactile guide path as the two common barrier-free facilities provided in their housing estate (90.94% and 48.31%, respectively). Furthermore, the results revealed that the lift facilities for wheelchair (platform lift and stair lift) were rarely provided in their residential areas.

Table 29. Percentage of barrier-free facilities by types of housing

	Barrier-free facilities [n (%)] [^]			
	Public (n = 500)	Private (n = 875)	Others (n = 18)	Total (N = 1393)
Ramp ^a	425 (85.17)	823 (94.16)	17 (94.44)	1265 (90.94)
Tactile guide path ^a	383 (76.75)	281 (32.15)	8 (44.44)	672 (48.31)
Automatic door ^a	62 (12.42)	149 (17.05)	0 (0.00)	211 (15.17)
Platform lift ^a	47 (9.42)	71 (8.12)	1 (5.56)	119 (8.55)
Stair lift ^a	35 (7.01)	55 (6.29)	0 (0.00)	90 (6.47)

Note. N = 1393.

[^] Multiple answers were allowed.

^a Percentage was calculated for the participants who indicated that the barrier-free facilities were provided.

4.13.2 Protective Facilities at Home

To measure whether the participants had installed any protective facilities to protect themselves or the cohabited member who was an older adult or immobile, several questions regarding the in-house protective facilities were included. Overall, only one-fourth of the participants (25.20%) indicated that they had installed protective facilities at their homes. The percentage of owning protective facilities was 20.42% and 30.78% for younger and older participants, respectively. Among the participants who had installed protective facilities, the top two facilities being installed were handrail (77.55%) and non-slip floor tile (34.67%). Table 30 summarizes the percentage of the protective at home by age groups.

Table 30. Percentage of protective facilities at home by age groups

Age group	Protective facilities [n (%)] [^]		
	45 – 64 years (n = 262)	65+ years (n = 338)	Total (N = 600)
Handrail ^a	212 (81.54)	251 (74.48)	463 (77.55)
Non-slip floor tile ^a	98 (37.69)	109 (32.34)	207 (34.67)
Emergency alarm / Care-on-call Service ^a	36 (13.85)	113 (33.53)	149 (24.96)
Bath chair ^a	54 (20.77)	72 (21.36)	126 (21.11)

Note. N = 600.

[^] Multiple answers were allowed.

^a Percentage was calculated for the participants who indicated that the barrier-free facilities were provided.

4.14 Participation in Volunteering Activities

Participants were asked to indicate whether they had engaged in any of the four instrumental and seven cognitively demanding volunteering activities in the past twelve months. The results showed

that 47.23% of the participants had engaged in volunteering activities in the past year. Table 31 summarizes the frequency of participating volunteering activities in the past year. Overall, 55.70% of the participants engaged in volunteering less than once a month. In particular, 60.11% of the younger participants and 50.74% of older participants, who had volunteered, indicated that they participated in volunteering less than once a month. However, these results should be interpreted with caution, as the data were collected during the COVID-19 pandemic in which a wide range of social activities were suspended, tremendously reducing the opportunity for participation in various volunteering activities.

Table 31. Frequency of volunteering activities in the past one year

Age group	Frequency of volunteering [<i>n</i> (%)]		
	45-64 years (<i>n</i> = 552)	65+ years (<i>n</i> = 574)	Total (<i>n</i> = 1126)
Less than once a month	318 (60.11)	239 (50.74)	557 (55.70)
Once a month	32 (6.05)	28 (5.94)	60 (6.00)
More than once a month	56 (10.59)	60 (12.74)	116 (11.60)
2 – 4 times a month	63 (11.91)	63 (13.38)	126 (12.60)
More than 4 times a month	60 (11.34)	81 (17.20)	141 (14.10)

Note. *N* = 1126.

Furthermore, for those participants who had volunteered, there were 33.33% and 57.04% of participants had engaged in instrumental or cognitively demanding volunteering activities, respectively.

The results regarding the volunteering activities are summarized in Table 32.

Table 32. Participation in instrumental and cognitively demanding volunteering activities

Age group	Types of volunteering activities (%)		
	45-64 years (<i>n</i> = 552)	65+ years (<i>n</i> = 574)	Total (<i>n</i> = 1126)
1. Instrumental	33.64	32.04	33.33
Fundraising	12.18	20.85	16.58
Food preparation	18.91	13.07	15.95
Driving	5.45	3.00	4.21
Garden maintenance	4.00	2.12	3.05
2. Cognitively demanding	57.45	56.64	57.04
Management	12.36	9.72	11.02
Teaching	23.45	19.82	21.61
Clerical work	6.00	6.90	6.46
Befriending	17.64	23.67	20.70
Coaching	3.09	3.36	3.23
Art media production	6.91	9.36	8.15
Personal care	4.91	4.42	4.66

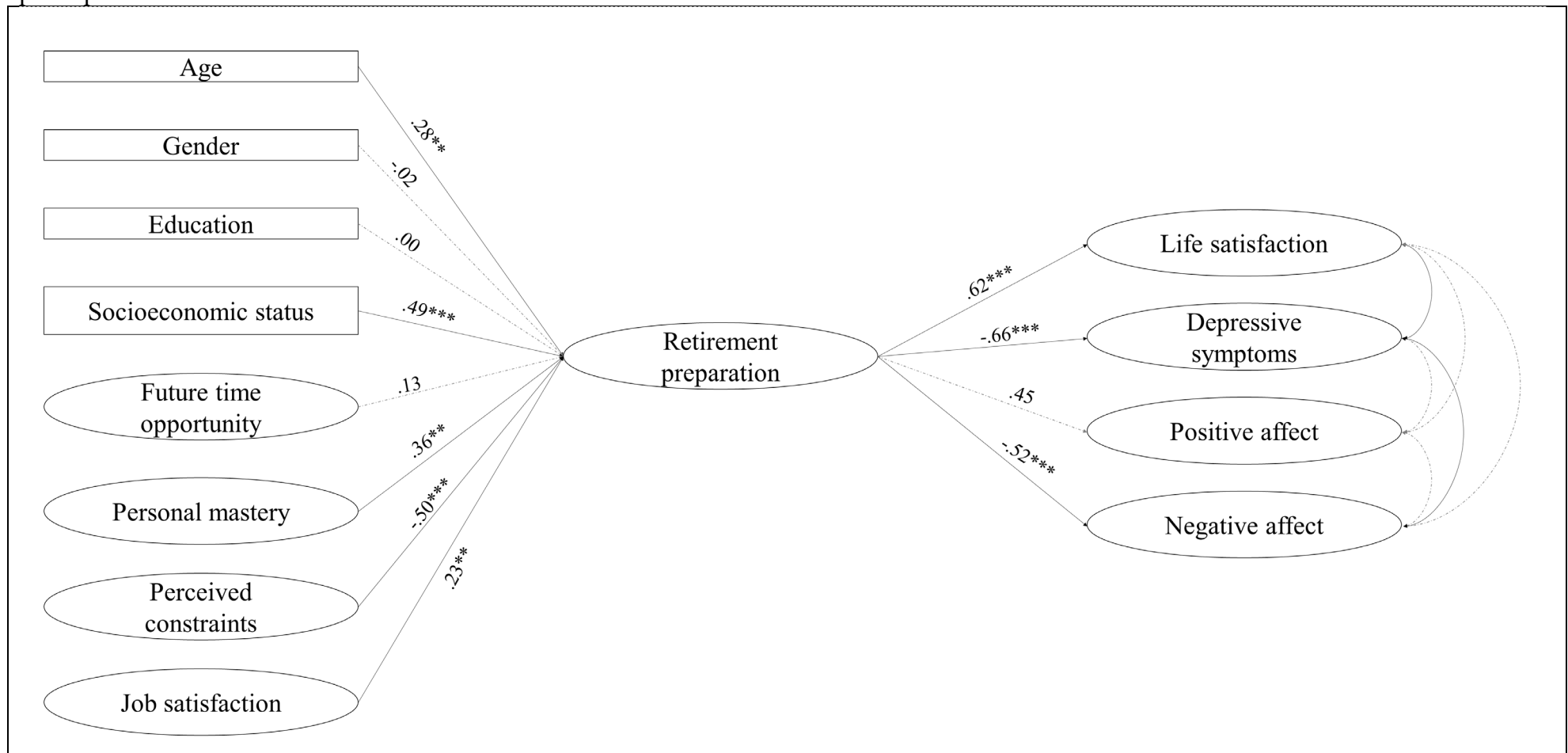
Note. *N* = 1126.

4.15 Relationships among Individual Attributes, Retirement Preparation, and Psychological Well-being

The effects of individual attributes on retirement preparation and the effects of retirement preparation on psychological well-being among working adults (RQ1) were examined simultaneously in one structural equation modeling (SEM) using R package lavaan (Rosseel, 2012). The predictors for retirement preparation included individual attributes (age, gender, education level, socioeconomic status, future time opportunity, personal mastery, perceived constraints, and job satisfaction). The psychological well-being was indicated by life satisfaction, depressive symptoms, positive affect, and negative affect, which were inputted as dependent variables. In the SEM analysis, mean- and variance-adjusted weighted least squares (WLSMV) were used for estimation. The standardized coefficients (β) are reported for all the following analyses.

Figure 1 presents the SEM model outlining the relationships among individual attributes, retirement preparation, and psychological well-being. The results of the SEM model revealed that working participants who were older in age ($\beta = .28, p = .002$), had a higher level of perceived socioeconomic status ($\beta = .49, p < .001$), personal mastery ($\beta = .36, p = .002$), job satisfaction ($\beta = .23, p = .003$), and a lower level of perceived constraints ($\beta = -.50, p < .001$) were more likely to carry out retirement preparation. Thus, the RQ1 regarding the predictivity of individual attributes of retirement preparation was supported. In addition, the results of SEM further disclosed the positive effects of retirement preparation on psychological well-being of working participants. The working adults who had prepared for their retirement was more likely to report a higher level of life satisfaction ($\beta = .62, p < .001$), a lower level of depressive symptoms ($\beta = -.66, p < .001$) and negative affect ($\beta = -.52, p < .001$) than those who did not prepare much for their retirement.

Figure 1. The SEM model on the relationship among individual attributes, retirement preparation, and psychological well-being among working participants



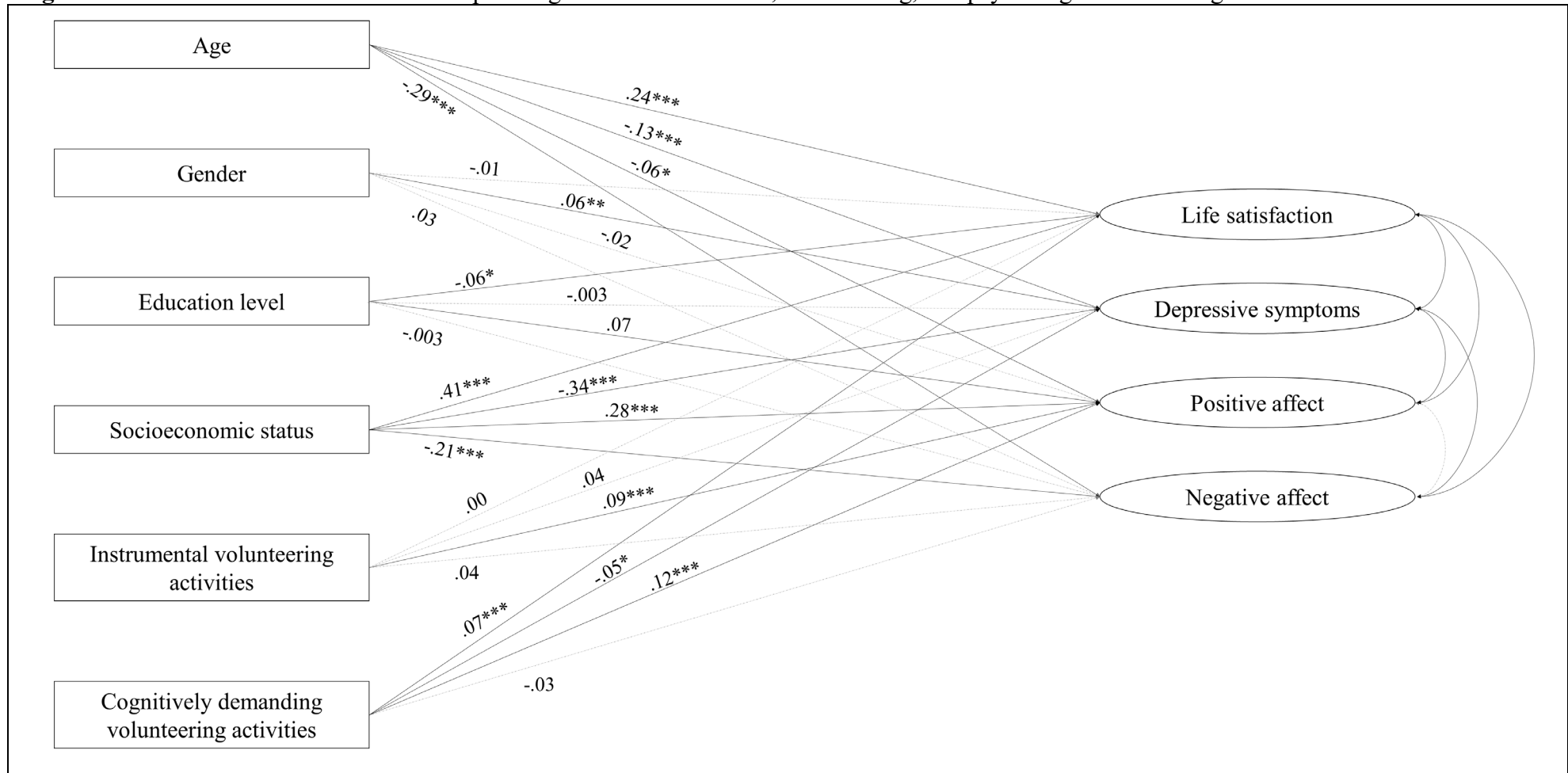
Note. $N = 705$. Gender was coded as 1 = male and 2 = female. Education was coded as 1 = primary and below, 2 = secondary, and 3 = post-secondary. For simplicity, the observed indicators of the latent variables are not shown in the figure. The ellipses represent the latent variables whereas the rectangles represent the observable variables. Numbers in the figure indicates the standardized regression coefficients. The solid lines denote significant associations between variables at $p < .05$ whereas the dashed lines indicated non-significant associations. Goodness of fit: $\chi^2(1627) = 4430.50, p < .001$; CFI = .91; RMSEA = .06; SRMR = .07. ** $p < .01$; *** $p < .001$.

4.16 Relationship among Individual Attributes, Volunteering, and Psychological Well-being

The effects of individual attributes and volunteering on psychological well-being (RQ2) were examined in SEM using R package lavaan (Rosseel, 2012). The predictors for psychological well-being included individual attributes (age, gender, education level, and socioeconomic status) and participation in instrumental and cognitively demanding volunteering activities. The psychological well-being outcomes included life satisfaction, depressive symptoms, positive affect, and negative affect which were inputted as dependent variables. In the SEM analysis, mean- and variance-adjusted weighted least squares (WLSMV) were used for estimation. Below we reported the standardized coefficients (β) for all analyses.

Figure 2 and Table 33 present the results of SEM model on the relationship among individual attributes, volunteering, and psychological well-being. The results of the SEM model indicated that the participants who were older ($\beta = .24, p < .001$), with lower education attainment ($\beta = -.06, p = .01$), perceived a higher socioeconomic status ($\beta = .41, p < .001$), and participated in cognitively demanding volunteering activities ($\beta = .07, p < .001$) were more likely to report a higher level of life satisfaction. In terms of depressive symptoms, the findings revealed that the participants who were younger in age ($\beta = -.13, p < .001$), being female ($\beta = .06, p = .007$), perceived a lower socioeconomic status ($\beta = -.34, p < .001$), and less likely to participate in cognitively demanding volunteering activities ($\beta = -.05, p = .02$) were more likely to report more depressive symptoms. For positive affect, the participants who were younger in age ($\beta = -.06, p = .01$), with a higher education attainment ($\beta = .07, p = .01$), perceived a higher socioeconomic status ($\beta = .28, p < .001$), participated in instrumental volunteering activities ($\beta = .09, p < .001$) as well as cognitively demanding volunteering activities ($\beta = .12, p < .001$), were more likely to experience greater positive affect. Lastly, only age ($\beta = -.29, p < .001$) and socioeconomic status ($\beta = -.21, p < .001$) were the significant predictors of negative affect. Thus, the RQ2 regarding the predictiveness of participation in volunteering activities on the well-being in the late adulthood was supported.

Figure 2. The SEM model on the relationship among individual attributes, volunteering, and psychological well-being



Note. $N = 2391$. Gender was coded as 1 = male and 2 = female. Education was coded as 1 = primary and below, 2 = secondary, and 3 = post-secondary. Dummy variables for instrumental volunteering and cognitively demanding volunteering were computed (0 = not participated and 1 = participated). For simplicity, the observed indicators of the latent variables are not shown in the figure. The ellipses represent the latent variables whereas the rectangles represent the observable variables. Numbers in the figure indicate the standardized regression coefficients. The solid lines denote significant associations between variables at $p < .05$ whereas the dashed lines indicated non-significant associations. Goodness of fit of this structural equation model: $\chi^2(395) = 3223.60$, $p < .001$; CFI = .93; RMSEA = .06; SRMR = .07. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 33. Parameter estimates on the relationship among individual attributes, volunteering, and psychological well-being

	Life satisfaction	Depressive symptoms	Positive affect	Negative affect
	β	β	β	β
Age	.24 ***	-.13 ***	-.06 *	-.29 ***
Gender	-.01	.06 **	-.02	.03
Education	-.06 *	-.003	.07 *	-.003
Socioeconomic Status	.41 ***	-.34 ***	.28 ***	-.21 ***
Instrumental volunteering activities	.00	.04	.09 ***	.04
Cognitive demanding volunteering activities	.07 ***	-.05 *	.12 ***	-.03

Note. $N = 2391$. β denotes standardized regression coefficient.

* $p < .05$; ** $p < .01$; *** $p < .001$.

4.17 The Effects of Individual Attributes, Volunteering, and Health-promoting Behaviors on Cognitive Function

The effects of individual attributes and behavioral attributes on cognitive function (RQ3) was tested by a hierarchical regression model. Unlike other statistical models reported above, most of the variables included in this analysis were categorical variables and were measured with a single item, hierarchical regression analysis was therefore more appropriate. The predictors included individual attributes (age, gender, education level, socioeconomic status, and retirement status) and behavioral attributes (instrumental volunteering activities, cognitively demanding volunteering activities, and physical activities which was measured by HPLP-II). The MoCA score was inputted as the outcome variable to indicate the level of cognitive function. Below we reported the standardized coefficients (β) for all analyses.

Table 34 summarizes the results of the hierarchical multiple regression model on the predictive of individual attributes, volunteering, and health-promoting behaviors on cognitive function. Individual attributes were entered to Model 1 and the behavioral attributes were entered to Model 2. The expected predictivity of individual attributes and behavior attributes on cognitive function was supported. The results of Model 1 with individual attributes, including age, gender, education level, socioeconomic status, and retirement status, as predictors were statistically significant [$F(6, 2358) =$

210.1, $p < .001$; R^2 change = .35]. After adding the behavioral attributes, including instrumental volunteering activities, cognitively demanding volunteering activities, and physical activity, Model 2 significantly accounted for an additional variance of 7.7% in MoCA scores [$F(9, 2319) = 142.4$, $p < .001$]. The results revealed that the participants who were younger in age ($\beta = -.27$, $p < .001$), attained secondary education ($\beta = .88$, $p < .001$) or post-secondary education ($\beta = 1.13$, $p < .001$), perceived a higher socioeconomic status ($\beta = .10$, $p < .001$), being retired ($\beta = .14$, $p = .002$), participated in cognitively demanding volunteering activities ($\beta = .15$, $p < .001$), and conducted physical activity frequently ($\beta = .04$, $p = .03$) showed better cognitive function.

Table 34. Hierarchical regression model on the predictivity of individual attributes, volunteering, and health-promoting behaviors on cognitive function

	Model 1	Model 2
	β	β
1. Individual attributes		
Age	-.25***	-.27***
Gender ^a	.05	.04
Education level ^b		
Secondary	.89***	.88***
Post-secondary	1.17***	1.13***
Socioeconomic status	.11***	.10***
Retired	.16**	.14**
2. Behavioral attributes		
Instrumental volunteering activities		-.07
Cognitively demanding volunteering activities		.15***
Physical activity		.04*
ΔR^2	.35***	.08*

Note. $N = 2391$. Cognitive function was indicated by MoCA scores. ^a Gender was coded as 1 = male and 2 = female.

^b The reference group was primary school. $\Delta R^2 = R^2$ Change.

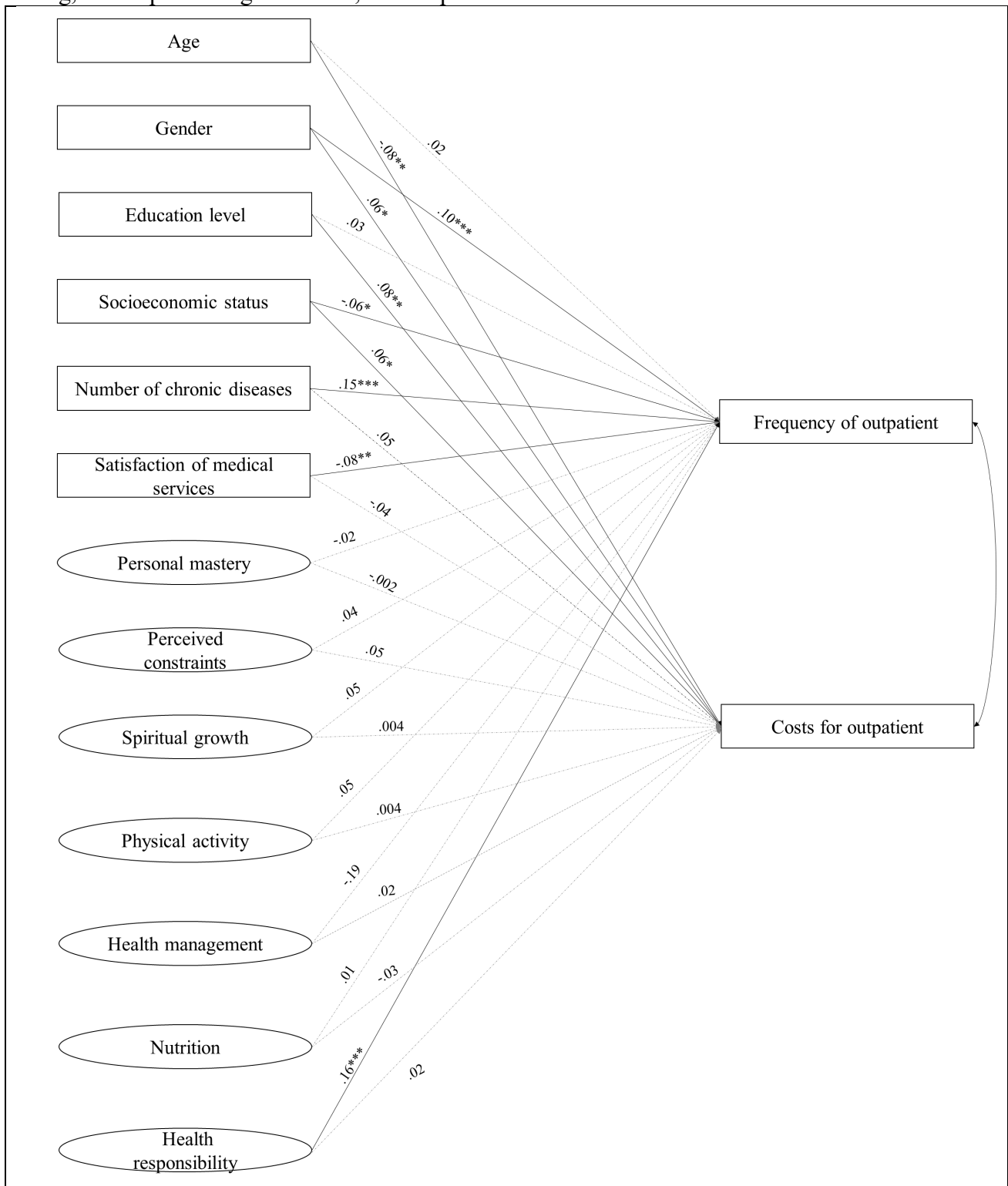
* $p < .05$; ** $p < .01$; *** $p < .001$.

4.18 Predictors of Outpatient Service Utilization

The predictors of outpatient service utilization (RQ4) were examined by SEM using R package lavaan (Rosseel, 2012), including individual attributes (age, gender, education level, socioeconomic status, and number of chronic diseases), level of satisfaction of medical services, psychological well-being (personal mastery and perceived constraints), health-promoting behaviors (spiritual growth, physical activity, health management, nutrition, and health responsibility). The outpatient service utilization was indicated by frequency of and expenditure on outpatient services, which were inputted as dependent variables in the SEM model. The centered score of frequency and costs for outpatient services were computed for analyses. In the SEM analysis, mean- and variance-adjusted weighted least squares (WLSMV) were used for estimation. Below we reported standardized coefficients (β) for all analyses.

Figure 3 presents the results of SEM on the relationships among individual attributes, psychological well-being, health-promoting behaviors and utilization of outpatient services. In terms of frequency of using outpatient services in the past year, the results revealed that the participants who were female ($\beta = .10, p < .001$), with lower socioeconomic status ($\beta = -.06, p = .02$), had more chronic diseases ($\beta = .15, p < .001$) and lower satisfaction with medical services ($\beta = -.08, p = .005$), and conducted more health responsibility behaviors ($\beta = .16, p < .001$) utilized outpatient services more frequently. For the expenditure on outpatient services, the findings suggested that the participants who were younger in age ($\beta = -.08, p = .004$), being female ($\beta = .06, p = .02$), with higher education attainment ($\beta = .08, p = .003$), and with higher socioeconomic status ($\beta = .06, p = .02$) tended to spend more on the outpatient services in the past one year.

Figure 3. The SEM model on the relationship among individual attributes, psychological well-being, health promoting behaviors, and outpatient service utilization



Note. $N = 2391$. Gender was coded as 1 = male and 2 = female. Education was coded as 1 = primary and below, 2 = secondary, and 3 = post-secondary. The centered scores of frequency of and costs for outpatient services were computed. For simplicity, the observed indicators of the latent variables are not shown in the figure. The ellipses represent the latent variables whereas the rectangles represent the observable variables. Numbers in the figure indicates the standardized regression coefficients. The solid lines denote significant associations between variables at $p < .05$ whereas the dashed lines indicate non-significant associations. Goodness of fit of this structural equation model: $\chi^2(1120) = 5727.22$, $p < .001$; CFI = .90; RMSEA = .05; SRMR = .04. * $p < .05$; ** $p < .01$; *** $p < .001$.

4.19 Summary of the Findings

The current project has successfully implemented the baseline assessment of HKADA in a large and representative sample of 2392 middle-aged and older Hong Kong Chinese adults. This baseline study covers a wide array of domains, including physical, psychological, social and cognitive aspects, which are valuable for future investigation on development trajectories of local aging populations.

Four research questions were successfully tested using the baseline measures of HKADA. For the first RQ concerning the predictors of retirement preparation among working adults, the results of SEM revealed that the working participants who performed more retirement planning behaviors were older in age, had higher socioeconomic status, personal mastery and job satisfaction, and a lower level of perceived constraint. The effect of volunteering on psychological well-being was assessed in the second RQ. The results of SEM showed that relative to instrumental activities (e.g., food preparation and fundraising), participation in cognitively demanding volunteering activities (e.g., teaching and befriending) was associated with better psychological well-being, such as higher levels of life satisfaction and positive affect and fewer depressive symptoms. The overall prevalence of mild cognitive impairment (MCI) in the sample of older adults aged 65 and above was also studied in this project (RQ3). The results revealed that 14.86% of the participants aged 65 years and above had MCI, which was similar to the prevalence of MCI in previous local studies (e.g., Xu et al., 2020; Yeung et al., 2014). The results of the hierarchical regression analyses indicated that the participants who were younger and retired, attained secondary or post-secondary education, perceived higher socioeconomic status, participated in cognitively demanding volunteering activities, and frequently conducted physical activity were more likely to show better cognitive function. The fourth research question examined the predictors of utilization of outpatient services. The results revealed that the participants who were female, had lower socioeconomic status, with more diagnosed chronic diseases, lower satisfaction with medical services, and more health responsibility-related behaviors tended to utilize outpatient services more frequently.

Furthermore, the latest usage of ICT for various purposes was also investigated in the current sample. The results showed that among older participants aged 65 and above, ICT was most frequently used for social purposes while it was least used for financial and medical purposes. Compared with younger participants aged 45 – 64 years, over half of older participants indicated having no knowledge of using ICT for financial and medical purposes. Slightly more than half of the current sample indicated their intention to take part in continuing education programs to advance their ICT knowledge and skills.

5. Policy Implications and Recommendations

5.1 Retirement Preparation

- ❖ The results of the current project showed that the retirement preparatory activities were generally low among the working and non-working participants. Specifically, on average, both working and non-working participants performed less than a half of the 20 retirement preparatory activities. In addition, the current research has shown that the individuals with lower retirement preparation were more likely to experience poorer psychological well-being. Thereby, encouraging both working and non-working adults to make early preparation for their retirement and old age is recommended.
- ❖ The findings of the current project disclose the individual attributes of the participants with lower levels of retirement planning, such as being younger in age, having lower socioeconomic status and job satisfaction. Future programs on retirement preparation should target the individuals with these characteristics.
- ❖ Among the four types of preparatory behaviors for retirement, psychological and social life preparatory behaviors remained low. It is therefore recommended that the pre-retirement planning workshops and seminars should cover a wider scope of topics such as psychological and social planning, in addition to financial and health planning.

5.2 Healthcare Services

- ❖ Both age groups heavily utilized public medical system for healthcare services, such as outpatient services and hospitalization, including the participants with moderate socioeconomic status. Given the limited capacity of public hospitals, the government is recommended to engage more private sectors through the Public Private Partnership (PPP) Programme and other initiations to divert

more healthcare services to the private sectors.

- ❖ About 15% of the older participants in the current community-dwelling sample were suspected of having mild cognitive impairment (MCI). To sustain cognitive functioning in old age, non-governmental organizations serving middle-aged and older adults are recommended to organize workshops (e.g., continuing education on ICT use) or leisure activities (e.g., board games) that are cognitively stimulating. The government is also recommended to allocate more resources to provide screening services to individuals aged 65 years and above, allowing early detection of cognitive declines and early intervention for the at-risk groups.
- ❖ The purchase of health-related insurance products remained low in both age groups (45 – 64 years and 65+ years), especially over 75% of the older participants and over 50% of younger participants in the current sample did not have any health or critical illness insurance. It is recommended to continue to promote the tax-deduction for qualifying premiums paid under the Voluntary Health Insurance Scheme among working adults, to reduce the demand for public healthcare services.

5.3 Use of ICT

- ❖ The Hong Kong government has been actively promoting technology use among older adults for some years (e.g., Smart City Blueprint 2.0, December 2020). The current project examined the latest frequency of ICT use for various purposes. The results revealed that ICT use among middle-aged and older Hong Kong Chinese adults remained limited, particularly the ICT use for financial and medical purposes. Thereby, in addition to the current ICT training programs which often focus on social or leisure purposes, future programs can strengthen the ICT use in the financial and medical domains to broaden both middle-aged and older adults' utilization of the latest technologies. Outreach programs should also be strengthened, especially for the older people who live alone or seldom take part in social activities organized by NGOs. The design of these training programs should also consider the education levels and learning needs (social versus leisure versus health) of older adults to maximize the benefits of the training outcomes and cultivate their motivation in continuous learning.
- ❖ Furthermore, the literacy of ICT use remained lower. For example, more than a half of participants aged 65 years and above had no knowledge of how to use ICT for financial (e.g., online shopping and banking) and medical services (e.g., medical appointment and online consultation). However, only about half of the current sample indicated their intention to take part in continuing education programs to advance their ICT knowledge and skills. It is recommended to provide incentives to motivate both age groups to enroll in education

programs to improve their ICT literacy.

5.4 Participation in Volunteering Activities

- ❖ To explore the effects of different types of volunteering activities, the present project examined and compared the health benefits of instrumental volunteering (e.g., fundraising and food preparation) and cognitively demanding volunteering (e.g., teaching and befriending). The findings of the current project demonstrated that participating in cognitively demanding volunteering was associated with better outcomes, such as higher life satisfaction, more positive affect, and fewer depressive symptoms, whereas instrumental volunteering was only associated with more positive affect. Hence, the findings of this project reveal a stronger health-promoting effect of cognitively demanding volunteering on psychological well-being of middle-aged and older adults, relative to the effect of participation in instrumental volunteering activities. Organizers of future volunteering activities should therefore diversify the types of activities for volunteers, including more cognitively demanding activities.
- ❖ Volunteering in general provides a large resource of human capital to many social service agencies (Chou et al., 2003). While findings of this project suggest encouraging middle-aged and older adults to participate in cognitively demanding volunteering relative to other activities, instrumental volunteering activities often fulfil a significant societal function in the real world and cannot be simply neglected. Organizers of volunteering activities are thereby encouraged to develop a sustainable solution to meet the needs of volunteers in the communities. For example, time banking can be one of the possible approaches. Within the time banking system, volunteers receive an “hour” credit for each hour volunteer work and the gained credits can be exchanged for social services at a later time (Williams, 2004; Ng et al., 2020). The future time banking system can consider allocating more hour credits to cognitively demanding activities to encourage volunteers to take part in these activities.

6. Limitations of the Current Project

The current project has created the baseline measurement and data for future investigation of the developmental trajectories in physical, cognitive, and psychosocial well-being of middle-aged and older Chinese adults residing in Hong Kong. However, several limitations should be considered when interpreting the results reported above. First, the aforementioned relationships are only correlational,

thus the casual directions between constructs cannot be drawn. Longitudinal data should be obtained to replicate these relationships. For example, whether volunteering participation brings positive benefits to retirees' psychological well-being, or vice versa, can only be affirmed with multiple waves of longitudinal assessments.

Second, some of the participants might not recall the details of their utilization of medical services in the past year and purchased insurance policies, such as the total number of outpatient visits in the past year and the amount of insurance coverage. To reduce the recall bias in the future assessment, objective data, such as obtaining the e-health clinical data from the Hospital Authority and the summary of insurance policy coverage should be considered. In addition to the current objective assessments such as MoCA and handgrip measures, future studies may also consider including an ICT-related knowledge test to minimize the potential social desirability bias in reporting their ICT use.

Third, we sent out over 7000 invitation letters to the residential addresses of the 18 districts using the frame of quarters obtained from the Census and Statistics Department, with the goal of getting a representative sample. However, due to the outbreak of COVID-19 pandemic in January 2022, the response rate was far from satisfactory. As a result, alternate sampling methods were applied to reach out the target participants, including recruitment of participants through district councilors, non-government organizations, labor unions, and professional associations serving middle-aged and older adults. Even though mixed sampling methods were utilized in HKADA, the comparison of the demographic characteristics shows that the distribution of age, gender, and education level between the HKADA sample and the Hong Kong population in 2021 (Census and Statistics Department, 2022) was comparable, suggesting the representativeness of the current sample. Nevertheless, interpretation of the results of HKADA should be cautious with the consideration of the mixed sampling methods utilized in the current study.

Last but not least, some of the participants were interviewed and assessed during the periods with high COVID-19 infection cases in Hong Kong. Their responses to the questionnaires, particularly

the psychological constructs, such as affectivity, sense of control or future time perspective, might be affected by the perceived severity of the COVID-19 pandemic to some extent. For example, in the face of over 30,000 infection cases and high mortality rate per day between late February and early March, 2022, some of the participants' perception of future time would be more limited and constrained. Accordingly, the longitudinal investigation of these variables may take note of the potential skewed patterns in these variables at the baseline measurement.

7. Dissemination of Findings

The findings of this research project were/will be disseminated through various channels: peer-reviewed journals, international academic conferences, academic magazines and newspapers.

First, two papers have been published in peer-reviewed international journals:

- a. Yeung, D. Y., Chow, L. C., Ho, A. K. K., & Chung, E. K. H. (2022). The effect of information and communications technology use on well-being of older Hong Kong Chinese adults. *Educational Gerontology, Online First*. <https://doi.org/10.1080/03601277.2022.2160131>
- b. Chung, E. K. H., Ho, A. K. K., Lam, H. K. L., & Yeung, D. Y. (2023). Maintaining psychological well-being amidst the COVID-19 pandemic: The beneficial effects of health-promoting behaviors and sense of control. *Current Psychology, Online First*. <https://doi.org/10.1007/s12144-023-04514-3>

Second, three working papers are in the pipeline, including one paper under review, and two papers in preparation:

- a. Lin, G. J., Yeung, D. Y., Chung, E. K. H., & Ho, A. K. K. (2023). Profiles of preventive behaviors of middle-aged and older Hong Kong Chinese adults: A latent profile analysis. *Manuscript under review*.
- b. Ho, A. K. K., Yeung, D. Y., Chung, E. K. H., Lin, G. J., & Li, D. S. (2023). Future time perception matters: The moderating role of future time perspective in the effect of work-to-family conflict on depression and job satisfaction. *Manuscript in preparation*.
- c. Poon, C. T. H., Yeung, D. Y., Chung, E. K. H., & Lin, G. J. (2023). How do mobile games benefit middle-aged and older adults? A comparison based on the core mechanics of mobile games. *Manuscript in preparation*.

Third, three conference presentations and a research seminar were/will be given by the research team members using the baseline data of HKADA.

- a. Yeung, D. Y., Chow, N., Chung, E. K. H., & Ho, A. K. K. (November, 2022). *Technology use among older Chinese adults: Benefits on subjective well-being*. Poster presented in the Annual Conference of the Gerontological Society of America, Indianapolis, IN, USA. Also in *Innovation in Aging*, 6, S1, p.579. [https://academic.oup.com/innovateage/article/6/Supplement_1/NP/6939341 (p.579)]
- b. Chong, S.O.K., Chung, E.K.H., Yeung, D.Y., Lam, A.H.K., Lam, J.Y.C., & Ho, A.K.K. (July 2022). *Factors affecting older Hong Kong Chinese adults' perception of successful aging*. Poster presented in Ageing s Future 2nd Conference: Conceptions, Contexts, and Challenges of Long Lives, Jena, Germany. [https://www.geronto.fau.de/ageingasfuture-conference/wp-content/uploads/sites/5/2022/07/2nd-Ageing-as-Future-Conference-Program-2022_brochure.pdf (p.22)]
- c. Yeung, D.Y., Chung, E.K.H., Li, B.K.K., Ho, H.C.Y., Chen, F., Zhang, Z., & Cheong, A. (submitted for review). Active engagement after retirement: Insights obtained from the baseline assessment of the Hong Kong Longitudinal Study on Adult Development and Aging (HKADA). A symposium to be presented in the 2023 Annual Conference of the Gerontological Society of America.
- d. A research seminar will be organized in April or May to introduce the HKADA database and present the key findings of this baseline study. Invitation will be sent to government departments, NGOs, policy-makers and researchers who provide or are interested in elderly and retirement services.

Fourth, a featured article, Creating an Age Friendly Smart City, was published in an academic magazine, City CLASS Magazine, and the South China Morning Post on 17 January 2023. This article highlights the findings of ICT use among older Hong Kong Chinese adults.

[<https://www.scmp.com/presented/news/hong-kong/education/topics/creating-age-friendly-smart-city/article/3207042/getting-older-getting-over-creating-age-friendly-smart-city>]

8. Plan for the Longitudinal Assessments

The current project has successfully completed the baseline assessment of HKADA in various domains including physical, psychosocial, and cognitive well-being, which provides valuable data on the health circumstances of middle-aged and older Chinese adults in Hong Kong. Information of individual developmental trajectory will only be possible when the same participant is reassessed in the longitudinal study. Similar to other international longitudinal databases, such as HRS and CHARLS, the proposed interval between assessments is every two years. Ideally, at least three waves of longitudinal data should be obtained to understand the growth trajectory of the participants. To achieve this, the project team has applied for the General Research Fund (GRF) 2023/24 and has been working with the Development Office at CityU to identify potential funders / private foundations to support the second and third waves of longitudinal assessment of HKADA.

In the long run, funding will be sought from the collaborative and/or interdisciplinary funding schemes (e.g., Research Impact Fund) to support the fourth and fifth waves of longitudinal assessments. Efforts will also be made to maintain the current sample of 2391 participants in the database, such as sending a greeting card or a newsletter every year to stay in contact with each participant between assessment periods.

To reduce the manpower demand in each wave of assessment, the project team will also consider utilizing more online assessments, especially a substantial proportion of the middle-aged and older adults are technological competent to complete the online survey themselves. These measures will allow us to manage and share the dataset on the public platform more efficiently.

9. Conclusion

This project has successfully established a local longitudinal database on adult development and aging, and implemented the baseline assessment of HKADA in a large and representative sample of 2392 middle-aged and older Hong Kong Chinese adults. This baseline study covers a wide array of domains, including physical, psychological, social and cognitive aspects, which are valuable for future investigation on development trajectories of local aging populations. The findings of the current project

also disclose the latest patterns of retirement preparation, prevalence of MCI, utilization of healthcare services, and use of ICT in the mid-age and older populations in Hong Kong. Useful policy implications and recommendations were generated with reference to the empirical evidence of the HKADA data.

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