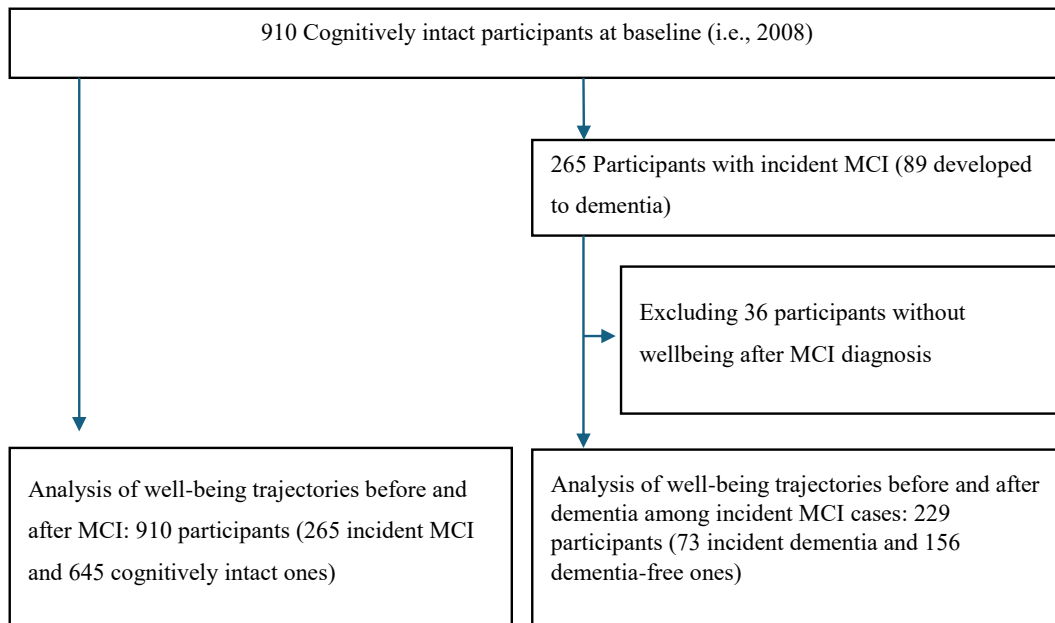


Supplementary file**Supplementary Figure 1. Flow chart of the study population**

Supplementary Text 1. Piecewise linear mixed-effect model

The piecewise linear mixed-effects model used in the analyses of the trajectories of psychological well-being before and after MCI diagnosis is as follows.

$$time\ spline = \begin{cases} 0 & \text{if } time \leq 0 \\ time & \text{if } time > 0 \end{cases}$$

$$y = \beta_0 + \beta_1 time + \beta_2 time\ spline + \beta_3 MCI + \beta_4 MCI * time + \beta_5 age + \beta_6 sex + \beta_7 education + Z\gamma + \varepsilon$$

- y is the psychological well-being or its components
- $time$ is aligned at the year of diagnosis for MCI ones and at the end of follow-up for cognitively intact ones
- $time\ spline$ is created based on $time$ and break point (i.e., year 0, the diagnosis year for MCI)
- MCI is a binary variable of mild cognitive impairment (Yes vs. No)
- age is the participant's age at year 0, i.e., MCI diagnosis age for those with MCI and age at the end of follow-up for those cognitively intact
- Z is the known matrix of random effects
- γ is the unknown vector of random-effects parameters
- ε is the unobserved vector of random errors.

The piecewise linear mixed-effects model used in the analyses of the trajectories of psychological well-being before and after dementia diagnosis is as follows.

$$time\ spline = \begin{cases} 0 & \text{if } time \leq 0 \\ time & \text{if } time > 0 \end{cases}$$

$$y = \beta_0 + \beta_1 time + \beta_2 time\ spline + \beta_3 dementia + \beta_4 dementia * time + \beta_5 age + \beta_6 sex + \beta_7 education + Z\gamma + \varepsilon$$

- y is the psychological well-being or its components
- $time$ is aligned at the year of diagnosis for dementia ones and at the end of follow-up for dementia-free ones
- $time\ spline$ is created based on $time$ and break point (i.e., year 0, the diagnosis year for dementia)
- $dementia$ is a binary variable of dementia onset (Yes vs. No)

- age is the participant's age at year 0, i.e., dementia diagnosis age for those with dementia and age at the end of follow-up for those who were dementia-free
- Z is the known matrix of random effects
- γ is the unknown vector of random-effects parameters
- ε is the unobserved vector of random errors.

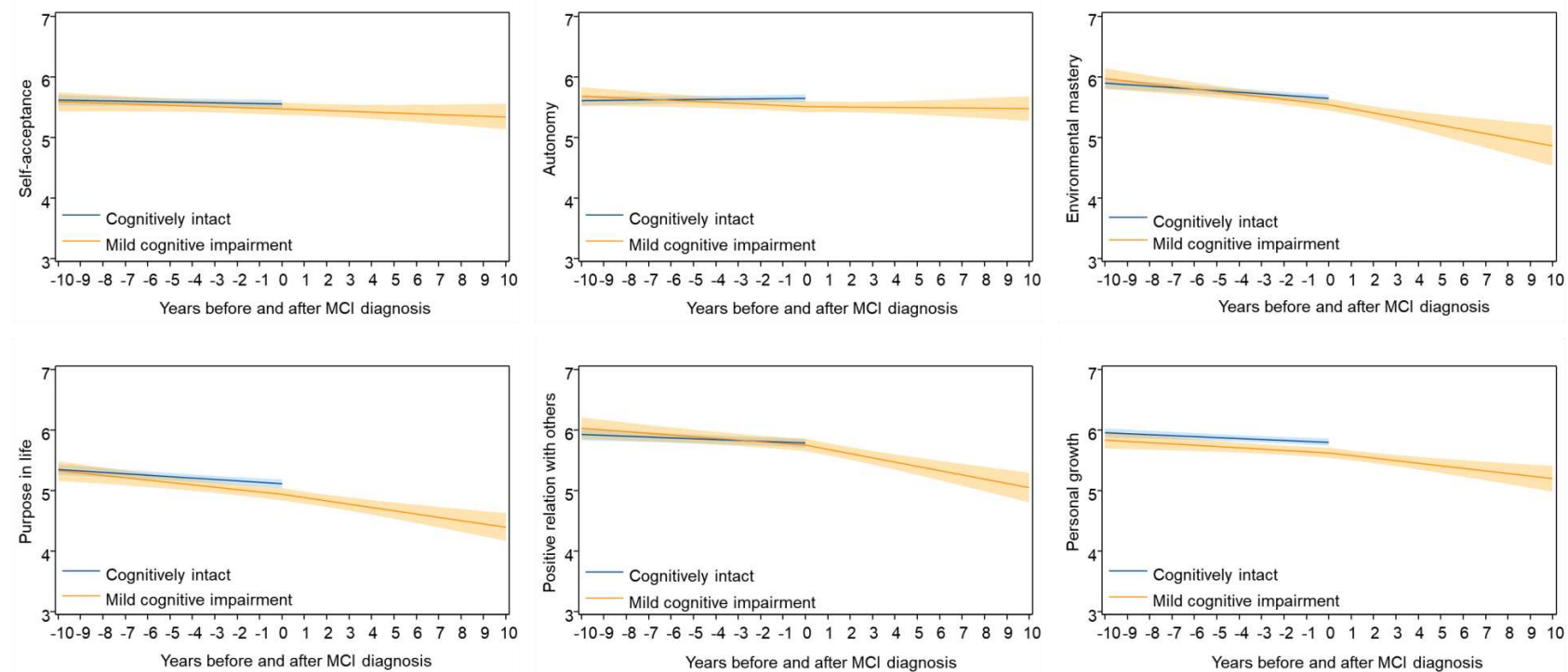
Supplementary Table 1. Psychological well-being items

Well-being	Item no.	Item
Positive relations with others	1	Maintaining close relationships has been difficult and frustrating for me.
	2	People would describe me as a giving person, willing to share my time with others.
	3	I have not experienced many warm and trusting relationships with others.
Self-acceptance	4	I like most parts of my personality.
	5	When I look at the story of my life, I am pleased with how things have turned out so far.
	6	In many ways I feel disappointed about my achievements in life.
Autonomy	7	I tend to be influenced by people with strong opinions.
	8	I have confidence in my own opinions, even if they are different from those of others.
	9	I judge myself by what I think is important, not by the values of others.
Personal growth	10	For me, life has been a continuous process of learning, changing, and growing.
	11	I think it is important to have new experiences that challenge how I think about myself and the world.
	12	I gave up trying to make big improvements or changes in my life a long time ago.
Environmental mastery	13	The demands of everyday life often get me down.
	14	In general, I feel I am in charge of the situation in which I live.
	15	I am good at managing the responsibilities of daily life.
Purpose in life	16	Some people wander aimlessly through life, but I am not one of them.
	17	I live life one day at a time and don't really think about the future.
	18	I sometimes feel as if I've done all there is to do in life.

Supplementary Table 2. Multi-adjusted β coefficient (95% CI) of psychological well-being change before and after mild cognitive impairment diagnosis

Model terms	β coefficient (95% CI)	<i>P</i> value
Slope before MCI diagnosis for cognitively intact subjects	-0.012 (-0.018, -0.005)	<0.00
Slope before MCI diagnosis for incident MCI subjects	-0.024 (-0.034, -0.013)	<0.001
Difference in slope before MCI diagnosis	-0.012 (-0.024, 0.000)	0.058
Slope after MCI diagnosis for incident MCI subjects	-0.043 (-0.058, -0.028)	<0.001
Difference in slope before and after MCI diagnosis	-0.019 (-0.040, 0.002)	0.076

Model was adjusted for age at time 0, sex, education, physical activity, body mass index, any of vascular disease risk factors, any of vascular diseases, depression syndrome, apolipoprotein E ϵ 4 carrier, social activity, social network, and loneliness.



Supplementary Figure 2. Trajectories of psychological well-being components before and after mild cognitive impairment diagnosis.

Model was adjusted for age at time 0, sex, and education.

Year 0 indicates the year of MCI diagnosis or the year corresponding to the end of follow-up (for participants who remained cognitively intact).

Supplementary Table 3. β coefficient (95% CI) of six components of psychological well-being change before and after mild cognitive impairment diagnosis.

Model terms	Basic-adjusted β coefficient (95% CI)	P value	Multi-adjusted β coefficient (95% CI)	P value
Self-acceptance				
Slope before MCI diagnosis for cognitively intact subjects	-0.006 (-0.015, 0.002)	0.156	-0.005 (-0.014, 0.005)	0.323
Slope before MCI diagnosis for incident MCI subjects	-0.012 (-0.028, 0.005)	0.171	-0.008 (-0.024, 0.009)	0.353
Difference in slope before MCI diagnosis	-0.005 (-0.024, 0.014)	0.588	-0.003 (-0.022, 0.016)	0.759
Slope after MCI diagnosis for incident MCI subjects	-0.013 (-0.034, 0.009)	0.237	-0.011 (-0.033, 0.011)	0.347
Difference in slope before and after MCI diagnosis	-0.001 (-0.033, 0.03)	0.928	-0.003 (-0.035, 0.029)	0.867
Autonomy				
Slope before MCI diagnosis for cognitively intact subjects	0.004 (-0.004, 0.012)	0.312	0.005 (-0.004, 0.014)	0.276
Slope before MCI diagnosis for incident MCI subjects	-0.017 (-0.033, -0.001)	0.037	-0.007 (-0.024, 0.009)	0.390
Difference in slope before MCI diagnosis	-0.021 (-0.04, -0.003)	0.020	-0.012 (-0.031, 0.007)	0.202
Slope after MCI diagnosis for incident MCI subjects	-0.003 (-0.025, 0.019)	0.780	-0.008 (-0.031, 0.016)	0.519
Difference in slope before and after MCI diagnosis	0.014 (-0.017, 0.045)	0.367	0.000 (-0.032, 0.032)	0.981
Environmental mastery				
Slope before MCI diagnosis for cognitively intact subjects	-0.025 (-0.035, -0.015)	<0.001	-0.026 (-0.038, -0.015)	<0.001
Slope before MCI diagnosis for incident MCI subjects	-0.043 (-0.062, -0.024)	<0.001	-0.040 (-0.059, -0.020)	<0.001
Difference in slope before MCI diagnosis	-0.018 (-0.04, 0.004)	0.109	-0.014 (-0.036, 0.009)	0.238
Slope after MCI diagnosis for incident MCI subjects	-0.068 (-0.102, -0.033)	0.000	-0.058 (-0.092, -0.024)	0.001
Difference in slope before and after MCI diagnosis	-0.025 (-0.068, 0.018)	0.256	-0.018 (-0.061, 0.025)	0.416
Purpose in life				
Slope before MCI diagnosis for cognitively intact subjects	-0.023 (-0.033, -0.014)	<0.001	-0.021 (-0.032, -0.010)	0.000
Slope before MCI diagnosis for incident MCI subjects	-0.039 (-0.057, -0.021)	<0.001	-0.038 (-0.057, -0.019)	0.000
Difference in slope before MCI diagnosis	-0.015 (-0.036, 0.005)	0.140	-0.017 (-0.039, 0.005)	0.137
Slope after MCI diagnosis for incident MCI subjects	-0.054 (-0.077, -0.031)	<0.001	-0.059 (-0.083, -0.035)	<0.001
Difference in slope before and after MCI diagnosis	-0.015 (-0.049, 0.018)	0.370	-0.021 (-0.057, 0.014)	0.244

Positive relation with others

Slope before MCI diagnosis for cognitively intact subjects	-0.014 (-0.023, -0.005)	0.002	-0.014 (-0.024, -0.003)	0.009
Slope before MCI diagnosis for incident MCI subjects	-0.028 (-0.045, -0.01)	0.002	-0.025 (-0.043, -0.007)	0.008
Difference in slope before MCI diagnosis	-0.014 (-0.033, 0.006)	0.170	-0.011 (-0.032, 0.010)	0.296
Slope after MCI diagnosis for incident MCI subjects	-0.07 (-0.095, -0.046)	<0.001	-0.072 (-0.097, -0.046)	<0.001
Difference in slope before and after MCI diagnosis	-0.042 (-0.075, -0.009)	0.012	-0.047 (-0.082, -0.012)	0.009

Personal growth

Slope before MCI diagnosis for cognitively intact subjects	-0.015 (-0.023, -0.007)	0.000	-0.012 (-0.021, -0.003)	0.012
Slope before MCI diagnosis for incident MCI subjects	-0.021 (-0.037, -0.005)	0.008	-0.018 (-0.034, -0.001)	0.033
Difference in slope before MCI diagnosis	-0.006 (-0.024, 0.012)	0.501	-0.006 (-0.025, 0.013)	0.541
Slope after MCI diagnosis for incident MCI subjects	-0.043 (-0.065, -0.021)	0.000	-0.049 (-0.071, -0.027)	<0.001
Difference in slope before and after MCI diagnosis	-0.021 (-0.052, 0.009)	0.173	-0.031 (-0.063, 0.000)	0.051

Basic-adjusted model was adjusted for age at time 0, sex, and education. Multi-adjusted model was adjusted for age at time 0, sex, education, physical activity, body mass index, any of vascular disease risk factors, any of vascular diseases, depression syndrome, apolipoprotein E ε4 carrier, social activity, social network, and loneliness.

Supplementary Table 4. Differences in psychological well-being between dementia cases and non-dementia ones in the 5 years before dementia diagnosis among participants with incident mild cognitive impairment.

Year	No. of non-dementia	No. of dementia	Difference in mean (95% CI)	<i>P</i> -value
-5	51	16	-0.091 (-0.315, 0.134)	0.397
-4	67	21	-0.094 (-0.291, 0.103)	0.387
-3	92	33	-0.097 (-0.276, 0.081)	0.387
-2	110	47	-0.101 (-0.272, 0.071)	0.344
-1	130	66	-0.104 (-0.281, 0.074)	0.344
0	156	73	-0.107 (-0.302, 0.088)	0.387

Difference in mean was calculated as the mean of well-being in participants with dementia minus that in those cognitively intact. Negative value means that well-being was poorer in participants with dementia. Model was adjusted for age at time 0, sex, and education.

Year 0 indicates the year of dementia diagnosis or the year corresponding to the end of follow-up (for participants who were dementia-free).

To account for the multiple testing, *P*-values and confidence intervals (CIs) in the table were calculated using a simulation-based approach combined with a step-down fashion.