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Economic strain and well-being in late life: findings from an 18-year population-based longitudinal study of older Taiwanese adults

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ABSTRACT

Background This study estimates the concurrent and longitudinal effects of perceived economic strain and socioeconomic status (SES) on well-being of older adults in Taiwan.

Methods This study uses data from the Taiwan Longitudinal Study on Aging, a nationally representative sample ($n = 3602$) of older adults aged 60 and above. Participants were interviewed and followed for 18 years. Individual well-being is measured by self-reported life satisfaction, psychological distress and perceived health status. Generalized linear modeling with the generalized estimating equation estimates is used to predict the relationships between perceived economic strain, SES and well-being cross-sectionally and longitudinally, controlling for individual background characteristics, physical health and survival status.

Results Older adults who experienced economic strain had significantly poorer well-being in comparison to older adults without strain, both cross-sectionally and longitudinally, controlling for SES and other covariates. In contrast, SES indicators did not consistently predict well-being in the cross-sectional and longitudinal analyses.

Conclusions These findings suggest a strong, cumulative, negative effect of perceived economic strain on well-being among older adults. Health-care initiatives aiming at promoting well-being among older adults should consider the impact of economic strain, which may increase at the end of the life course and threaten health and functioning.

Keywords longitudinal analysis, older adults, perceived economic strain, socioeconomic status, Taiwan, well-being and health

Introduction

In Taiwan, the proportion of persons over the age of 65 has increased steadily in recent decades. However, well-being does not always accompany increased longevity, and therefore, public health concern for the maintenance of good health and quality of life among this population has also increased. Of particular concern is how socioeconomic status (SES) and economic strain in later life may contribute to differences in health and well-being among older adults.[1,2]

Well-being is the self-evaluation of individual lives[3,4] assessed by life satisfaction, psychological distress and perceived health.[4–6] Previous studies have demonstrated that poor well-being negatively influences physical health, functioning and quality of life for individuals and their families[7–10] and even contributes to the increased risk for mortality.[11,12] In studies of Western populations, poor health and well-being is consistently associated with low income[13–15] and material factors such as individual material and resource deprivation to poverty in the local community.[15–17] Insights provided by the stress process model[18,19]

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indicated that low-status groups are more vulnerable to poor health and well-being than others based on disadvantages inherent to their social location. These disadvantages, known as 'stressors', are socially patterned disproportionately experienced by members of low-status groups. For example, low SES persons may be at increased risk for poor well-being because they more frequently experience economic strain. Research examining the effect of financial difficulties on health and well-being supports the idea that the subjective experience of 'economic strain' is related to, but independent of, SES.[20–25] Kahn and Pearlin[26] provides evidence that financial strain has a significant influence on a range of health outcomes. Using retrospective data from 1167 older adults, their findings suggest sustained financial hardship that has a cumulative negative effect on health outcomes later in life, independent of income and other SES indicators.

Economic strain, as stressor,[19,27] could play an important, albeit different, role in the experience of health and well-being among older adults in Taiwan.[28–31] The social values of Confucius such as in Taiwan emphasize the adequacy of how basic needs are met rather than overall levels of income and wealth. However, the concept of strain inherent suggests difficulty in the ability to meet basic needs. The goal of this study is to investigate both the concurrent and cumulative effects of perceived economic strain on well-being using prospective, longitudinal data collected from a nationally representative sample of older adults, in Taiwan, controlling for economic resources such as income and home ownership, SES, sociodemographic characteristics, physical health status, social functioning and survival status in a multivariate model.

Methods

Data and sample

The data for this analysis are from the Taiwan Longitudinal Study on Aging (TLSA), a nationally representative survey designed to study the impact of socioeconomic development on the physical and emotional health of older adults in Taiwan. Data were collected by the Bureau of Health Promotion of the Taiwan Public Health Department from 1989 to 2007. The baseline sample was derived using a three-stage sampling framework. A total of 4049 older adults were first interviewed in-person in 1989, with four follow-up interviews conducted between 1996 and 2007 for surviving participants. Information on TLSA can be found at www.bhp.doh.gov.tw and further details on the TLSA sampling and design are reported elsewhere.[32,33] For this study, the analytic sample was restricted to the baseline, with complete data on SES, economic strain and indicators of well-being. The sample flow is shown in Fig. 1.

Measures

Well-being

Well-being was assessed by three self-reported measures on life satisfaction, psychological distress and health status. The Life Satisfaction Index (LSI) is a 10-item scale adaptation of the original 20-item LSI.[34] LSI items include 'Has your life been better than most people's lives?' and 'Are you satisfied with your life?' and were rated yes or no. Items were reverse scored when necessary and summed so that higher LSI scores corresponded with better life satisfaction. Psychological distress was measured by a 10-item version of the Center of Epidemiological Studies-Depression (CES-D) scale.[35] Each item was rated on a four-point scale, indicating the frequency of experiencing each symptom in the past week. Responses were reversely scored when necessary so that higher scores represented higher levels of depressive symptoms. Previous analysis of the TSLA data demonstrated two distinct domains in the 10-item CES-D: negative affect and lack of positive affect.[32,36] Items were summed within each of the two domains.[24] Health status was measured by the SF-36 item which asked individuals to rate their health as 'poor,' 'fair,' 'good,' 'very good' or 'excellent' on a scale of 1–5.[37]

Economic strain

Economic strain was a time-varying covariate that was assessed whether individuals had enough living expenses. The responses ranged from more than enough to very insufficient but the points of the rating scales used varied across TLSA waves. A dichotomous measure of economic strain was created for the analysis 1 = 'insufficient' (i.e. strain) and 0 = 'sufficient' (i.e. no strain).

The SES measures

The SES measures included time-varying indicators of economic resources (i.e. household income and home ownership), work status and a baseline measure of education. Household monthly income categories varied across waves; for the analysis, quartiles were used to for consistency in the ranking of household income over time. Home ownership at each wave was coded 1 if the respondent's owned their current residence and 0 if not. Work status was categorized as unemployed, assisting family, full- or part-time work and retired for each wave. Education consists of four categories (illiterate, incomplete primary education, completed primary education and high school or above).

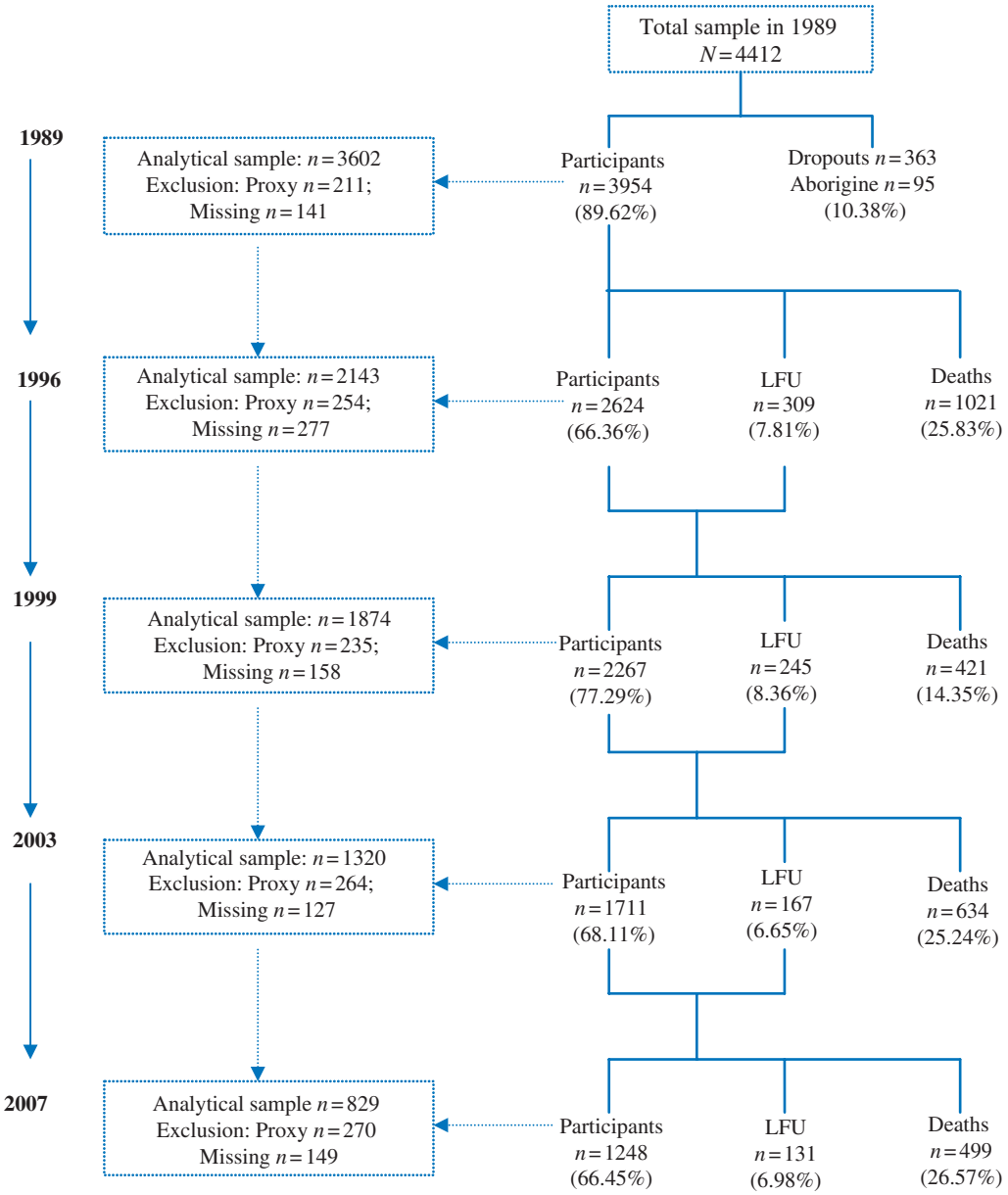

Fig. 1 Participants in serial surveys in the TLSA from 1989 to 2007. LFU is lost to follow-up mainly due to moving and rejection to be interviewed. Missing is incomplete data on major constructs.

Controls

The analyses were adjusted for several time-varying health indicators. Physical disability was measured by the Instrumental Activities of Daily Living (IADL) and Nagi scales.[38] The IADL scale assessed if respondents had difficulty with shopping, managing money, using transportation, doing heavy housework or using a telephone. The Nagi scale assessed difficulty with crouching, raising hands overhead, grasping small objects with their fingers, lifting heavy objects, walking 200–300 m or climbing stairs. These two physical disability measures were dichotomized for the analyses (1 = no limitations, 0 = at least one limitation) based on approaches used in prior studies.[39–43] Respondents indicated a history of cardiovascular disease (CVD) if: (i) a doctor ever told respondents they had a heart attack, coronary heart disease or other heart problems; (ii) they had a stroke; and (iii) they have diabetes. Endorsing any of these conditions was coded as 1 and otherwise 0.[44]

Several family and demographic characteristics were examined including a time-varying measure of marital status (married, widowed and other) and the number of children reported at baseline. Age and gender were measured by the

standard survey questions. Ethnic groups reflect post-industrial patterns of Taiwanese migration (Fukianese, Hakka and Mainlander).

Statistical analysis

Parallel linear regression models were used to estimate cross-sectional and longitudinal associations of economic strain and SES with each measure of well-being (i.e. life satisfaction, psychological distress and self rated health). Generalized estimating equations (GEE) with robust standard error estimates were used to take into account within-subject correlations during the 18-year follow-up period.[45–47] Estimated associations were described in the form of adjusted coefficients and STATA version 9.0[48] was used to manage and analyze data. Data from the 1989 baseline, 1996, 1999, 2003 and 2007 follow-up interviews were assessed simultaneously in all analyses.

The initial analyses examined the cross-sectional association between economic strain and each outcome well-being. Each model was then adjusted for the health and demographic covariates and whether the respondent was deceased in 2007, and finally for SES. The baseline measures of well-being were included to reduce unobserved heterogeneity. Given the considerable changes to family structure, SES and physical health at the end of the life course, we assessed the robustness of these associations over time. The longitudinal (transition) models included measures of well-being from previous waves to examine associations between economic strain and subsequent well-being.[49] Product terms representing interactions between economic strain and SES and gender were tested and excluded from the final models because of statistical non-significance.

Results

Sample characteristics

The characteristics of the analytic sample at baseline ($n = 3602$) are shown in Table 1. The sample was approximately equally distributed by gender, the majority (46.7%) was between the ages of 60 and older, and persons of Fukianese background comprised the largest ethnic group (61.9%). Overall, this sample indicated a notable amount of SES disadvantages as the majority of the sample was illiterate (40.0% and did not work (39.5%). However, over two-thirds of the respondents owned their home. Approximately 40% had experienced some physical limitations and 28% some form of CVD. Family support was evident at baseline, with the majority of respondents reporting being married (65.5%) and having large families (70.6%).

Economic strain was common, with one out of every four to five persons indicating that they had insufficient resources in the past year. However, reports of economic strain varied significantly by individual characteristics, as shown in Table 1. Economic strain was common among persons with low education ($\chi^2_{(3)} = 108.30$; $P < 0.001$) and low income ($\chi^2_{(3)} = 171.76$; $P < 0.001$). Strain was also more likely among the Fukianese ($\chi^2_{(2)} = 7.96$; $P = 0.019$) and those persons with fewer children ($\chi^2_{(2)} = 19.51$; $P < 0.001$). Economic strain was also more likely among persons reporting CVD and physical disability. And finally, older adults who reported economic strain at baseline were also more likely to be deceased before 2007 ($\chi^2_{(1)} = 15.69$; $P < 0.001$).

Cross-sectional associations

Table 2 presents multivariate regression models testing the cross-sectional associations between economic strain and each of the three indicators of well-being. Model 1 for each outcome adjusts for the effects of the sociodemographic characteristics, family background and concurrent physical health. We found that older adults who reported economic strain perceived lower levels of life satisfaction ($\beta = -1.21$; $P < 0.001$) and health status ($\beta = -0.24$; $P < 0.001$), and higher levels of psychological distress on both domains ($\beta = 1.52$, $P < 0.001$ for negative affect; $\beta = 0.67$, $P < 0.001$ for lack of positive affect) in comparison to older adults with no strain. Model 2 for each outcome adjusts the relationships between economic strain and well-being for the effects of SES, as measured by household income, home ownership, education and work status. The relationship between economic strain and life satisfaction remained largely independent of SES, although being in higher education and income strata modestly improved life satisfaction. The strain effect on negative affect did not have a substantial change after inclusion of the SES variables. Relative to the effect observed for economic strain, the associations between current SES and well-being were not as large, with the exception of education which had a significant positive effect in predicting life satisfaction and perceived health. Notable among the control variables, all outcomes decreased significantly with the presence of CVD and limitation in physical functioning.

Longitudinal associations

Table 3 presents multivariate regression results for longitudinal (transition) models, which are adjusted for both static (i.e. gender, ethnicity and education at baseline) and the time-specific covariates (i.e. SES, physical health and prior levels of strain and well-being). As in the previous analyses,

Table 1 Baseline (1989) sample characteristics of the TLSA and bivariate differences in self-reported economic strain ($N = 3602$)

	Total	*Economic strain*	
		Yes	*No*
Gender (%)			
Female	42.06	24.49	75.51
Male	57.94	20.22	79.78
Age (%)			
60–64 years	37.62	21.85	78.15
65–74 years	46.70	21.94	78.06
75–84 years	14.30	22.91	77.09
≥85 years	1.39	20.00	80.00
Ethnicity (%)			
Fukianese	61.94	23.53	76.47
Hakka	14.85	20.00	80.00
Mainlander	23.21	19.26	80.74*
Education (%)			
Illiterate	40.01	28.77	71.23
Incomplete primary education	15.87	26.09	73.91
Completed primary education	24.30	17.39	82.61
High-school graduate and above	19.82	10.66	89.34***
Work status (%)			
No work	39.47	22.10	77.90
Assisting family	24.94	23.16	76.84
Full- or part-time work	21.72	21.87	78.13
Retired	13.86	20.04	79.96
Monthly household income (%)			
The lowest	32.28	28.92	71.08
The second quartile	27.87	28.46	71.54
The third quartile	25.67	16.21	83.79
The highest quartile	14.17	3.77	96.23***
Home ownership (%)			
Owned	63.86	21.00	79.00
None	36.14	23.63	76.37
CVD related disease (%)			
Yes	28.73	28.03	71.97
No	71.27	19.59	80.41***
IADL (%)			
Any of five selected limited functions	40.14	30.50	69.50
None	59.86	16.33	83.67***
Nagi (%)			
Any of six selected limited functions	43.36	28.96	71.04
None	56.64	16.72	83.28***
Marital status (%)			
Married	65.53	21.24	78.76
Widowed	27.42	23.20	76.80
Separated/divorced/never married	07.06	24.80	75.20
Number of children (%)			
0–3	29.37	26.64	73.36
4–5	32.94	20.52	79.48
≥6	37.69	19.39	80.61***
Survival status in 2007 (%)			
Deceased in 2007	63.24	24.10	75.90
Alive until 2007	35.90	18.33	81.67
Lost to follow-up	0.86	22.58	77.42***

χ^2 test was used to test for group differences in economic strain.
*$P < 0.05$.
**$P < 0.01$.
***$P < 0.001$.

we observe that persons perceiving economic strain have lower life satisfaction over time in Model 1 ($\beta = -0.72$; $P < 0.001$) and that this significant association remains even when the changing SES circumstances in the sample are taken into account ($\beta = -0.65$; $P < 0.001$). A similar pattern emerges for both domains of depressive symptoms; the transition effect of economic strain was also found to be significantly associated with increasing subsequent psychological distress on both domains ($\beta = 0.85$, $P < 0.001$ for negative affect; $\beta = 0.37$, $P < 0.001$ for lack of positive affect) and decreasing subsequent perceived health ($\beta = -0.14$; $P < 0.001$) after adjusting for prior well-being and the other covariates. Although the magnitude of these effects was smaller relative to the cross-sectional analysis due to the inclusion of prior measures of strain and each outcome, overall, these findings suggest that the lasting effects of economic strain accumulate over time.

A sensitivity analysis was performed to assess the effect of loss to follow-up over time. Attrition rates in TSLA are similar longitudinal surveys of older adults such as the HRS/AHEAD study in the USA where attrition is largely due to death.[50] We assessed differences in SES, individual background and physical health between continuing participants and dropouts across waves (the results not tabled). Due to a large number of male migrants from China in 1949, males comprised 57.94% of the baseline analytical sample. The proportion of males in the sample relative to females continued to decline over the course of the data collection: 56.23% in 1996; 55.66% in 1999; 54.85% in 2003; and 54.16% in 2007. The analyses indicated that the proportions of older adults with economic strain in the analytic samples slightly increased from 22.02% in 1989 and 25.66%

Table 2 Adjusted cross-sectional associations of subjective economic strain and economic status with life satisfaction, psychological distress and self-rated health, TLSA 1989–2007

	Life satisfaction		*Depressive symptomatology*				*Self-rated health*	
			Negative affect		*Lack of positive affect*			
	Model 1 Coeff. (95% CI)	*Model 2* Coeff. (95% CI)	*Model 1* Coeff. (95% CI)	*Model 2* Coeff. (95% CI)	*Model 1* Coeff. (95% CI)	*Model 2* Coeff. (95% CI)	*Model 1* Coeff. (95% CI)	*Model 2* Coeff. (95% CI)
Economic strain								
Concurrent economic	−1.21***	−1.16***	1.52***	1.55***	0.67***	0.67***	−0.24***	−0.23***
strain (ref = no)	(−1.31, −1.10)	(−1.27, −1.05)	(1.33, 1.71)	(1.35, 1.74)	(0.57, 0.78)	(0.56, 0.77)	(−0.28, −0.20)	(−0.27, −0.19)
Socioeconomic status								
Household income (ref = lowest quartile)								
The second quartile		0.06		−0.20		0.02		0.03
		(−0.06, 0.17)		(−0.41, 0.01)		(−0.09, 0.14)		(−0.02, 0.08)
The third quartile		0.05		0.08		−0.01		0.01
		(−0.07, 0.18)		(−0.15, 0.31)		(−0.13, 0.11)		(−0.03, 0.06)
The highest quartile		0.16*		0.18		0.05		−0.001
		(0.02, 0.30)		(−0.08, 0.44)		(−0.09, 0.19)		(−0.06, 0.05)
Home ownership		0.05		0.14		0.02		−0.02
(ref = no)		(−0.05, 0.14)		(−0.03, 0.31)		(−0.07, 0.11)		(−0.06, 0.01)
Education (ref = illiterate)								
Incomplete primary		0.11		−0.05		−0.04		−0.03
education		(−0.04, 0.27)		(−0.33, 0.22)		(−0.17, 0.09)		(−0.03, 0.08)
Completed primary		0.27***		−0.20		−0.11		−0.05
education		(0.14, 0.41)		(−0.44, 0.05)		(−0.22, 0.01)		(−0.004, 0.10)
High-school graduate		0.30***		−0.15		−0.10		0.12***
and above		(0.14, 0.47)		(−0.44, 0.15)		(−0.24, 0.04)		(0.05, 0.18)
Employment status (ref = unemployed)								
Assisting family		0.04		−0.38***		−0.04		0.04
		(−0.07, 0.16)		(−0.59, −0.17)		(−0.15, 0.08)		(−0.001, 0.09)
Full- or part-time work		0.07		−0.21		−0.04		0.10**
		(−0.08, 0.22)		(−0.48, 0.06)		(−0.18, 0.11)		(0.04, 0.16)
Retired		0.01		−0.14		−0.01		0.02
		(−0.13, 0.16)		(−0.39, 0.12)		(−0.14, 0.12)		(−0.04, 0.07)
Physical health control								
CVD (ref = no)	−0.19***	−0.20***	0.63***	0.63***	0.09*	0.09*	−0.29***	−0.29***
	(−0.28, −0.09)	(−0.30, −0.10)	(0.45, 0.80)	(0.45, 0.80)	(0.0003, 0.18)	(0.003, 0.19)	(−0.33, −0.25)	(−0.33, −0.25)

IADL (ref = no	−0.44***	−0.41***	1.15***	1.12***	0.30***	0.29***	−0.28***	−0.27***
limitation)	(−0.55, −0.34)	(−0.52, −0.30)	(0.96, 1.35)	(0.92, 1.31)	(0.19, 0.40)	(0.18, 0.39)	(−0.33, −0.24)	(−0.31, −0.23)
Nagi (ref = no	−0.28***	−0.28***	0.75***	0.74***	0.20***	0.20***	−0.33***	−0.33***
limitation)	(−0.39, −0.17)	(−0.39, −0.17)	(0.55, 0.95)	(0.54, 0.93)	(0.09, 0.31)	(0.09, 0.31)	(−0.38, −0.29)	(−0.37, −0.28)
Comparison of Model 2 to Model 1								
χ^2		72.26***		52.61***		8.22		68.90***
Degree of freedom		10		10		10		10

All models adjusted for age, gender, ethnicity, marital status, number of children, survival status, waves of interview, baseline values of life satisfaction, psychological distress and self -rated health.

*$P < 0.05$.

**$P < 0.01$.

***$P < 0.001$.

in 1996 to 27.59% in 1999 and then turned to decline from 25.08% in 2003 to 22.80% in 2007.

Discussion

Main finding of this study

This study supports previous studies demonstrating a robust cross-sectional association between economic strain and well-being.[8,21,24,31] Our analyses further demonstrate that economic strain predicts well-being over and above SES both cross-sectionally and longitudinally. The multivariate longitudinal analysis indicates that the harmful effect of economic strain accrues over time, suggesting that economic strain is cumulatively associated with declining well-being in later life. This association is consistent across three aspects of well-being—life satisfaction, depressive symptoms and perceived health status—suggesting that economic strain broadly affects health and quality of life at older ages.

What is already known on this topic

Subjective well-being has been shown to differ by indicators of social stratification.[13–17] Disparities by SES factors are frequently a focus of research related to aging and well-being in industrialized countries.[1] Comparatively less attention has been concentrated on social group differences in well-being among the older members of the population in Asian countries. The stress process literature suggested perceived socioeconomic disadvantage to be associated with well-being.[22–28] This analysis suggests that the negative effects of economic strain may accumulate and diminish well-being among older adults in Asian countries.

What this study adds

To our knowledge, this is the first study that examines the longitudinal relationship between economic strain and well-being for older adults in Taiwan. Our results suggest that economic strain is more predictive of well-being than income. That is, perceived difficulty in meeting one's basic needs compromises well-being in later life, suggesting that quality-of-life gains among older adults have not kept pace with gains in longevity. In contrast, a robust, positive cross-sectional association was observed between higher levels of education and life satisfaction, particularly among high-school graduates versus those with incomplete primary education. This suggests that education is the most potent SES resource against declining well-being in older adulthood. However, education level does little to mitigate the strains imposed on well-being by financial hardship. These findings may be interpreted in the hedonic adaptation[3–5]

Table 3 Adjusted longitudinal (transition) associations of previous subjective economic strain and economic status with subsequent life satisfaction, psychological distress and self-rated health, TLSA 1989–2007

	Life satisfaction		*Depressive symptomatology*				*Self-rated Health*	
			Negative affect		*Lack of positive affect*			
	Model 1 *Coeff. (95% CI)*	*Model 2* *Coeff. (95% CI)*	*Model 1* *Coeff. (95% CI)*	*Model 2* *Coeff. (95% CI)*	*Model 1* *Coeff. (95% CI)*	*Model 2* *Coeff. (95% CI)*	*Model 1* *Coeff. (95% CI)*	*Model 2* *Coeff. (95% CI)*
Economic strain								
Previous economic strain (ref = no)	−0.72***	−0.65***	0.87**	0.85***	0.41***	0.37***	−0.16***	−0.14***
	(−0.89, −0.55)	(−0.82, −0.48)	(0.56, 1.17)	(0.54, 1.16)	(0.26, 0.56)	(0.21, 0.52)	(−0.22, −0.10)	(−0.21, −0.08)
Socioeconomic status								
Previous household income (ref = lowest quartile)								
The second quartile		0.12		−0.01		−0.05		0.0002
		(−0.06, 0.29)		(−0.34, 0.32)		(−0.21, 0.12)		(−0.07, 0.07)
The third quartile		0.05		0.09		−0.05		−0.03
		(−0.14, 0.24)		(−0.26, 0.44)		(−0.22, 0.13)		(−0.10, 0.04)
The highest quartile		−0.07		0.17		−0.11		0.003
		(−0.27, 0.14)		(−0.21, 0.55)		(−0.30, 0.08)		(−0.08, 0.08)
Previous home ownership (ref = no)		0.05		0.18		0.03		−0.04
		(−0.10, 0.18)		(−0.07, 0.43)		(−0.10, 0.16)		(−0.08, 0.01)
Education (ref = illiterate)								
Incomplete primary education		0.18		−0.08		−0.17		0.05
		(−0.03, 0.39)		(−0.46, 0.29)		(−0.37, 0.03)		(−0.03, 0.13)
Completed primary education		0.61***		−0.31		−0.24**		0.07*
		(0.43, 0.79)		(−0.63, 0.01)		(−0.41, −0.07)		(0.003, 0.14)
High-school graduate and above		0.77***		−0.41*		−0.37***		0.24***
		(0.55, 0.99)		(−0.80, −0.02)		(−0.57, −0.16)		(0.16, 0.32)
Employment status (ref = unemployed)								
Assisting family		0.02		−0.18		0.02		0.001
		(−0.15, 0.19)		(−0.49, 0.13)		(−0.14, 0.18)		(−0.06, 0.07)
Full- or part-time work		0.10		−0.11		−0.07		0.001
		(−0.10, 0.31)		(−0.49, 0.27)		(−0.26, 0.12)		(−0.08, 0.08)
Retired		0.06		−0.17		−0.003		0.04
		(−0.15, 0.27)		(−0.55, 0.20)		(−0.20, 0.19)		(−0.04, 0.12)
Physical health controls								
CVD (ref = no)	−0.10	−0.13	0.54***	0.55***	0.06	0.08	−0.30***	−0.32***
	(−0.24, 0.03)	(−0.27, 0.01)	(0.29, 0.79)	(0.30, 0.80)	(−0.07, 0.19)	(−0.05, 0.21)	(−0.36, −0.25)	(−0.36, −0.26)

IADL (ref = no limitation)	−0.56***	−0.52***	1.52***	1.50***	0.44***	0.42***	−0.34***	−0.34***
	(−0.72, −0.40)	(−0.68, −0.36)	(1.22, 1.82)	(1.20, 1.80)	(0.29, 0.59)	(0.27, 0.57)	(−0.40, −0.28)	(−0.40, −0.28)
Nagi (ref = no limitation)	−0.37***	−0.37***	1.17***	1.17**	0.27**	0.27**	−0.44***	−0.44***
	(−0.53, −0.20)	(−0.53, −0.20)	(0.86, 1.47)	(0.86, 1.47)	(0.12, 0.43)	(0.11, 0.42)	(−0.51, −0.38)	(−0.50, −0.38)
Comparison of Model 2 to Model 1								
χ^2	44.67***		6.72		13.70		52.98***	
Degree of freedom	10		10		10		10	

All models adjusted for age, gender, ethnicity, marital status, number of children, survival status, waves of interview, previous values of life satisfaction, psychological distress and self-rated health.
*$P < 0.05$.
**$P < 0.01$.
***$P < 0.001$.

and homeostasis[51] in which individuals may quickly adapt to static factors like their education level, but may less readily adapt to not having enough money on a day-to-day basis.

Taken together, our results suggest that economic strain independently contributes to poorer well-being for older adults in Taiwan. This analysis represents an important first step in examining multiple aspects of SES and poverty among non-Western industrialized countries. The industrialization of Taiwan in the last decades has dramatically changed labor market structure with large numbers of people seeking highly paid positions such as salesperson. As a result, income is often the focus of understanding health disparities and well-being among older adults in planning social and health initiatives. Our analyses suggested that the experience of economic strain rather than income threatens well-being and that the negative effects of strain accumulate. Therefore, future initiatives aimed at eliminating health disparities among older adults will benefit from considering economic strain as well as economic resources as risk factors for diminished quality of life.[52]

A particular strength of this analysis was the use of longitudinal data, which allowed us to examine change in well-being as a function of economic strain at a prior time and other dynamic indicators. While this analytical strategy intends to establish a causal link of economic strain to well-being, reciprocal causation could arise from a process of multiple system strain. That is, decline in well-being leads to economic strain, which in turn accelerates decline of well-being. In a separate analysis, we further restricted the sample to those who reported their health as fair and better or those whose baseline well-being was above 50 percentile. Economic hardship was still a significant predictor of subsequent well-being decline among the selected sample.

Limitations of this study

Although our research provides new information via a longitudinal analysis regarding economic strain, SES and well-being for older adults, this work is not without constraints. First, well-being as measured by the LSI, CES-D and self-rated health is subject to recall bias. Second, the assessment of other important covariates to predict relationships between economic strain and well-being is limited by the use of existing data in the TLSA, which lacks measures of related constructs such as financial support that ameliorated strain. Third, health measures are self-reported and the use of objective information, such as medical records, is precluded by the use of an existing data set. Fourth, this analysis covered an 18-year period, but it was obtained on a series of combined periods. The problem with measuring

well-being decline over longer periods of time is that there is greater risk of attrition due to mortality, particularly for older adults. We included the variable of survival status in the analysis and found that survivors had significant higher levels for all three well-being measures.

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