



Socioeconomic Disparities in Family Well-Being, Family Communication Quality, and Personal Happiness among Chinese: Findings from Repeated Cross-Sectional Studies in 2016–2023

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Abstract

Significant socioeconomic changes in Hong Kong have coincided with a conspicuous knowledge gap regarding the impact of disparities on family well-being, family communication quality, and personal happiness. To examine changes on family well-being, family communication quality, and personal happiness before, during, and after the 2019 social unrest and the COVID-19 pandemic in Hong Kong. Five repeated territory-wide cross-sectional surveys were conducted from 2016 to 2023, using telephone and online surveys on 27,074 adults in Hong Kong. Respondents rated their family health, happiness, harmony (family 3Hs), family communication quality, and personal happiness on scales of 0–10. Family well-being was the sum of family 3Hs divided by three (0–10). Trends by socioeconomic factors were analysed using linear prediction and multiple linear regression, weighted for sex and age. Highest scores for all outcomes were observed in 2016 and 2017, followed by a noticeable decline in 2020 and 2021, with the lowest scores recorded in 2023 except for personal happiness with its lowest score recorded in 2021. The decline since 2021 was most noticeable with low monthly household income (predicted margins in 2023 ranged from 5.55 to 6.46 for \leq HK\$19,999; 5.62 to 6.51 for HK\$20,000–39,999; 5.81 to 6.78 for \geq HK\$40,000), but no differences were observed by education level. Female, older age, and higher monthly household income were significantly associated with higher family well-being, family communication quality, and personal happiness (all $P < 0.001$). Higher education level was only significantly associated with personal happiness ($P = 0.008$). We have first shown socioeconomic disparities in the declining family well-being, family communication quality, and personal happiness from 2016 to 2023 in Hong Kong. These alarming findings require targeted interventions and policies aimed at addressing these disparities and improving wellbeing in the population.

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Keywords Socioeconomic disparities · Trend · Well-being · Happiness · Health

Introduction

Well-being is a multifaceted construct that encompasses the physical, mental, and social health aspects of human life. The family plays a pivotal role in shaping the emotional and psychological well-being of individuals and contributes to social well-being in communities (Thomas et al., 2017). Although substantial research exists on family and personal well-being, current literature falls short in fully exploring these constructs, adequately addressing socioeconomic disparities, and consistently defining family well-being. We searched Web of Science, PubMed, and ScienceDirect on 3rd September 2024, with keywords covering “socioeconomic disparities”, “family well-being”, and “personal happiness”. No articles were found that explored the trends of family well-being (family health, happiness, harmony, i.e. the family 3Hs), family communication quality, and personal happiness, overall or stratified by socioeconomic factors. This underexplored research gap warrants further investigation, especially in populations such as Hong Kong, where the emphasis on family relationships stemming from Confucian ethics positions family well-being essential to overall quality of life (Slote & De Vos, 1998). Alongside the role of Confucianism, the crowded urban environment, long work hours, academic pressures, and high living costs strain family dynamics. Confucian values of strong bonds, harmony, and respect for elders, stabilize and encourage familial support despite challenges. Comprehending socioeconomic factors and their well-being implications is crucial for devising targeted interventions and policies to enhance family and personal well-being, especially in Hong Kong, where traditional Confucian values coexist with modern urban stressors, demanding a delicate family balance. Hong Kong may not fully represent entire picture of other regions in mainland China due to significant regional economic, social, and cultural differences. Our study’s findings may provide valuable insights into family well-being within a unique urban context, serving as a foundation for future research across mainland China.

Despite economic prosperity, Hong Kong has witnessed a widening gap in income and wealth distribution, leading to a stark contrast between privileged and marginalized societal segments. Socioeconomic disparities in Hong Kong have become increasingly prevalent, affecting family well-being, and personal happiness, due to factors such as income inequality, social exclusion, and rapid urbanization (Chung et al., 2023). The issue of socioeconomic disparities has gained increasing worldwide attention, particularly regarding its paramount downturn in family well-being, family communication quality, and personal happiness (Wong et al., 2022; Wu & Tam, 2015). Such trend raises critical questions about the long-term implications of socioeconomic disparities on the overall well-being and the sustainability of its social fabric. Lower-income families often experience hardships like food insecurity, inadequate housing, and limited healthcare access (Evans & Kim, 2013), which can strain relationships, disrupt communication, and diminish family well-being (Conger et al., 2010). Individuals in these groups have limited access to resources promoting happiness and face increased stress from financial insecurity and work demands, ultimately

reducing overall happiness (Dolan et al., 2008). The Gini coefficient, a measure of income distribution, reached a record high of 0.539 in 2016, indicating an expansion of the income gap (Census and Statistics Department & Region, 2024). The 2019 social unrest (June 2019 to early 2020) and the COVID-19 pandemic (January 2020 to early 2023) had significantly impacted Hong Kong. Studies have shown that the 2019 social unrest and the COVID-19 pandemic have exacerbated existing disparities and introduced new challenges for individuals and families in Hong Kong by disrupting daily life, increasing psychological distress, and intensifying socioeconomic inequalities (Gong et al., 2022; Lee et al., 2023; Ni et al., 2020; Shen et al., n.d.; Zhao et al., 2020).

Socioeconomic disparities have far-reaching impacts on family well-being, family communication quality, and personal happiness. Western study has reported that income inequality is adversely associated with life satisfaction, mental health, and physical health (Pickett & Wilkinson, 2015). Social capital mediated the relation between socioeconomic status and well-being, with higher levels of trust and social cohesion dampening the adverse effects of inequality (Kawachi et al., 2008). Cultural and societal differences limit the applicability of these findings to Hong Kong. In Hong Kong, significant associations were observed between socioeconomic factors and multiple well-being dimensions, including mental health and subjective well-being (Chung et al., 2021), but not family well-being, family communication quality, and personal happiness. Despite the wealth of research on the detrimental effects of these disparities on individual and societal outcomes, a gap exists in understanding the trend of these outcomes in the recent context. Drawing on data from the “Family amid COVID-19 survey 3” (FamCov-3), this study investigated how does socioeconomic status associate with family well-being, family communication quality, and personal happiness in Hong Kong given the impacts of COVID and social unrest. We aim to provide new insights into the impacts of these disparities in Hong Kong, thereby informing potential policy interventions to address these inequalities.

Methods

Survey Design

Data from two Hong Kong Family and Health Information Trends Survey (FHIInTs) in 2016 and 2017, and three Family Amidst COVID-19 (FamCov) surveys, in 2020, 2021, and 2023 were analysed. The respondents for the five cross-sectional studies were individuals aged 18 years and above residing in Hong Kong, an urbanized Special Administrative Region of China. Non-voluntary participants or individuals with cognitive or language (i.e., Chinese) impairments were excluded. Informed consent explaining the study’s purpose, procedures, risks, and benefits, and emphasizing voluntary participation was obtained from all respondents before the data collection via online or telephone surveys. Confidentiality was maintained by anonymizing information, securely storing data, limiting access to authorized staff, and reporting aggregated results.

A reputable local survey agency conducted the surveys with trained staff. To ensure a diverse and representative sample of the Hong Kong population, the surveys used a mixed sampling approach, incorporating a probability-based panel of randomly selected individuals and volunteers who registered online. Using known prefixes from the Government Office of the Communications Authority's Numbering Plan, landline and mobile phone numbers were randomly generated. Invalid numbers and previous respondents' numbers were filtered out. For landline surveys, households were contacted, and the member with the nearest upcoming birthday was invited to participate. Our mixed sampling method comprised probability-based sampling (43.1%, $n=11665$) from randomly selected telephone numbers in Hong Kong and online registered volunteers (56.9%, $n=15409$) sourced from the local survey agency's panel.

This study has an adequate sample size, assuming a 2% margin of error, a 99% confidence interval, and a population proportion of 50% among Hong Kong's 6.5 million individuals aged 18 years or above. Of the 165,042 eligible respondents, 27,074 completed the entire survey, with a response rate of 16.4%. To guarantee data quality and validity in online and telephone surveys, we employed various strategies, such as questionnaire pilot testing, research staff training, consistency checks, and data cleaning. Online surveys incorporated validation and attention checks to avoid incomplete or inconsistent responses and maintain participant engagement. The Institutional Review Board (IRB) granted ethical approvals for these surveys (IRB reference nos.: UW 09-324, UW 20-651, UW20-238).

Instruments

Questionnaire was used to collect information on socioeconomic factors, family 3Hs, family communication quality and personal happiness. Family 3Hs were assessed using three separate questions: "Do you think your family is harmonious/happy/healthy?", each asking respondents to rate their family health, happiness, or harmony on a scale from 0 to 10, with higher scores indicating better outcomes (Lam et al., 2012). Family well-being was calculated by averaging the family 3Hs, with a score of 0 to 10 (Lam et al., 2012). Family communication quality was measured with respondents rating the quality of communication between themselves and their family members on a scale from 0 (very poor) to 10 (very good) (Guo et al., 2021). Personal happiness was measured by asking, "How happy do you think you are?" with responses from 0 (very unhappy) to 10 (very happy). These questions have been published, supporting their reliability and validity (Sit et al., 2022). Socioeconomic factors on sex (male/female), age (18–34 years/ 35–64 years/ ≥ 65 years), education (\leq secondary/ \geq tertiary), and monthly household income (\leq HK\$19,999/ HK\$20,000–39,999/ \geq HK\$40,000) (US\$1=HK\$7.8) were also collected.

Statistical Analysis

Mean scores for family well-being, family communication quality, and personal happiness were calculated for the entire sample and by sex, age, education, and monthly household income. Adjusted predicted margins (multi-adjusted means) of family

well-being, family communication quality, and personal happiness for each year were calculated with 95% confidence intervals (CIs), accounting for all covariates using linear prediction. Linear regression models were used to estimate adjusted regression coefficients (β s) along with their 95% CIs for the associations between the outcomes and socioeconomic factors. These socioeconomic factors were mutually adjusted and analysed by the year of data collection. Variance inflation factor (VIF) showed low levels of multicollinearity for socioeconomic factors (VIFs less than 2). The overall sample was weighed to Hong Kong 2021 Census sex and age distributions using post-stratification weighting. All analyses were conducted using STATA version 15.0 (StataCorp LP, College Station, TX, USA). A two-sided P of less than 0.05 indicated statistical significance.

Results

Table 1 shows that among the 27,074 included respondents, after weighting, 52.9% were female, 54.7% were aged 35–64, 61.5% had attained tertiary education, and 44% had a monthly household income of HK\$40,000 or more. The mean scores (\pm standard deviation) of the well-being scores were 6.86 (\pm 1.96) for family health, 6.88 (\pm 2.00) for family happiness, 7.1 (\pm 2.00) for family harmony, 6.92 (\pm 1.88) for family well-being, 6.43 (\pm 2.08) for family communication quality, and 6.45 (\pm 2.16) for personal happiness. Females reported higher scores on all outcomes than males (all P <0.001). Younger respondents (aged 18–34 years) reported the lowest scores for all outcomes (means ranged from 5.82 to 6.62), while those aged 65 or older reported the highest scores (7.12 to 7.67) (all P <0.001). Respondents with secondary education or lower reported higher scores in all outcomes than those with tertiary education. Respondents with higher monthly household income (\geq HK\$40,000) scored higher on all outcomes than those with lower income. Figure 1 shows that the highest scores for all outcomes were observed in 2016 and 2017 (6.91 to 7.63), followed by a noticeable decline in 2020 and 2021 (5.76 to 7.2), with the lowest scores recorded in 2023 (5.88 to 6.68) except for personal happiness with its lowest score of 5.76 recorded in 2021 (all P <0.001).

Figures 2, 3, 4 and 5 present the adjusted predicted margins (multi-adjusted means) of family well-being, family communication quality, and personal happiness from 2016 to 2023 by socioeconomic factors with mutual adjustment. Figure 2 shows no marked disparities in outcomes by sex, although personal happiness was greater in females than males and the gap in predicted margins increased from 2017 (0.26) to 2023 (0.66). Figure 3 shows all outcomes were rated higher with each older age group, generally stable from 2016 (predicted margins: 7.39 to 8.02) to 2017, declined in 2020, reaching their lowest in 2021 (6.56 to 7.34), and rebounded in 2023. Steeper declines were observed in the youngest age group of 18–34. The difference in predicted margins of family well-being between the oldest and youngest increased from 0.5 in 2017 to 1.45 in 2021. Figure 4 shows better outcomes with tertiary education in 2016 and 2017, but the advantage was lost in 2020 and 2021 due to steeper declines than those with secondary education. However, the advantage was regained in 2023 with rebounding outcomes in those with tertiary education but continuing decline in

those with \leq secondary education. Figure 5 shows better outcomes with each higher household income level. With steeper declines in the highest income group, their advantages over the lowest income group narrowed from 2016 to 2021. However, the strong re-bounce in outcomes observed only in the highest income group has widened the gap again in 2023. The difference in predicted margins for family well-being between the highest and lowest income groups was 0.87 in 2016, 0.4 in 2021 and 0.91 in 2023.

Table 2 presents the associations of socioeconomic factors with family well-being, family communication quality, and personal happiness. All outcomes were significantly higher in females (adjusted β s ranged from 0.1 to 0.37, all $P < 0.001$) than males, and in older age groups than those aged 18–34 years. Respondents aged ≥ 65 years had the best outcomes (β s=0.96 to 1.24, all $P < 0.001$). Compared with secondary or lower education, tertiary education was associated with significantly higher level of personal happiness (β =0.09, $p=0.008$) but not in other outcomes. The highest household income of \geq HK\$40,000 was associated with higher levels of all outcomes (β s=0.63 to 0.80, all $P < 0.001$). The associations for years indicated declines in all outcomes compared with 2016. The most substantial decline in outcomes were observed in 2021 (β s=-1.05 to -1.21, all $P < 0.001$).

Discussion

This study is the first population-based epidemiological studies using repeated cross-sectional studies to present novel evidence on the main trends and socioeconomic disparities in family well-being, family communication quality, and personal happiness, particularly in Asia. A decreasing trend was observed in all outcomes, with widening disparities in outcomes by monthly household income becoming more prominent in 2023. Similar finding has been reported in the United States, where income inequality was associated with disparities in life satisfaction, mental health, and physical health (Pickett & Wilkinson, 2015). The study revealed that females, older respondents, and those with higher household incomes reported higher scores in family well-being, family communication quality, and personal happiness over time. Females showed higher personal happiness than males, due to societal influences, biological differences, and increased emotional expression (Daalen et al., 2005; Olff et al., 2013; Parker & Brotchie, 2010; Sharpe & Heppner, 1991). Association between older age and improved well-being is supported by literature on adaptive coping strategies, emotional regulation, and cultural norms (Baltes & Carstensen, 1996; Smith & Hollinger-Smith, 2015). Higher education associates with higher pay and well-being (Fosnacht & Calderone, 2017), but during COVID-19, lower education levels associated with improved personal happiness possibly due to pandemic-related job stability. Household income positively associated with better outcomes by enabling access to resources and experiences (Ansari et al., 2012; Buunk et al., 1990; Newman et al., 2014). There were no significant associations between education and most outcomes, except for personal happiness.

The highest scores in family well-being and family communication quality were observed in 2016 and 2017, followed by a decline in 2020 and 2021, with the low-

Table 1 Family 3Hs, family communication quality, personal happiness and family well-being by socioeconomic factors (n = 27074)

	Unweighted	Weighted ^a	Family health (1 item, 0–10)	Family happiness (1 item, 0–10)		Family harmony (1 item, 0–10)		FC ^b quality (1 item, 0–10)		Personal happiness (1 item, 0–10)	
				N (%)	N (%)	mean (SD)	mean (SD)	P ^c	mean (SD)	P ^c	mean (SD)
Sex						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Male	12,113 (44.8)	12,701 (47.1)	6.84 (1.96)	6.82 (1.99)		7.09 (2)		6.88 (1.88)		6.37 (2.08)	6.26 (2.24)
Female	14,922 (55.2)	14,289 (52.9)	6.95 (1.94)	7.02 (1.99)		7.19 (1.97)		7.02 (1.87)		6.58 (2.05)	6.69 (2.08)
Missing	39										
Age, years						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
18–34	7165 (26.6)	5826 (21.6)	6.42 (2)	6.42 (2.08)		6.62 (2.1)		6.46 (1.94)		5.82 (2.17)	6.01 (2.14)
35–64	14,361 (53.2)	14,771 (54.7)	6.88 (1.88)	6.9 (1.91)		7.12 (1.93)		6.95 (1.8)		6.46 (1.97)	6.37 (2.14)
≥65	5464 (20.2)	6393 (23.7)	7.39 (1.95)	7.46 (1.96)		7.67 (1.89)		7.43 (1.85)		7.12 (2)	7.21 (2.05)
Missing	84										
Education						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
≤ Secondary	7365 (36.4)	10,348 (38.5)	7.06 (2.02)	7.19 (2.03)		7.38 (1.99)		7.15 (1.91)		6.76 (2.07)	6.91 (2.16)
≥ Tertiary	17,120 (63.6)	16,539 (61.5)	6.81 (1.9)	6.77 (1.95)		7 (1.97)		6.84 (1.84)		6.31 (2.05)	6.23 (2.13)
Missing	163	103				<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Monthly household income ^d											<0.001
≤ HK\$19,999	5503 (25.4)	5844 (26.9)	6.8 (2.15)	6.93 (2.18)		7.17 (2.13)		6.88 (2.08)		6.56 (2.19)	6.73 (2.26)

Table 1 (continued)

	Unweighted	Weighted ^a	Family health		Family happiness		Family harmony		Family well-being		FC ^b quality		Personal happiness (1 item, 0–10) (SD)
			(1 item, 0–10)	(1 item, 0–10)	mean (SD)	P ^c	mean (SD)	P ^c	mean (SD)	P ^c	mean (SD)	P ^c	
HK\$20,000– 39,999	6455 (29.8)	6313 (29.1)	6.76 (1.97)	6.77 (2.01)	6.98 (2.01)		6.82 (1.88)		6.28 (2.08)		6.4 (2.16)		
≥HK\$40,000	9718 (44.8)	9539 (44.0)	7.07 (1.78)	7.06 (1.82)	7.26 (1.85)		7.12 (1.7)		6.57 (1.94)		6.52 (2.06)		
Missing	5398	5294											
Year				<0.001		<0.001		7.63 (1.8)	<0.001	7.46 (1.68)	<0.001	<0.001	<0.001
2016	5080 (18.8)	5136 (19.0)	7.29 (1.91)	7.52 (1.84)									
2017	5063 (18.7)	5230 (19.4)	7.28 (1.86)	7.47 (1.85)			7.62 (1.82)		7.37 (1.82)		6.91 (1.92)		7.47 (1.85)
2020	4891 (18.1)	4882 (18.1)	7.2 (1.72)	6.78 (1.9)			7.15 (1.89)		7.04 (1.69)		6.51 (2.02)		6 (2.1)
2021	7535 (27.8)	7414 (27.5)	6.47 (2.02)	6.5 (2.04)			6.74 (2.06)		6.54 (1.94)		6.13 (2.15)		5.76 (2.09)
2023	4505 (16.6)	4328 (16.0)	6.39 (1.96)	6.45 (2.01)			6.68 (2.08)		6.48 (1.94)		5.95 (2.09)		5.88 (2.15)

^aWeighted by sex and age from census data (2021)^bFamily communication^cT-test (2 groups) and ANOVA (3–5 groups)^dUS\$1 = HK\$7.8

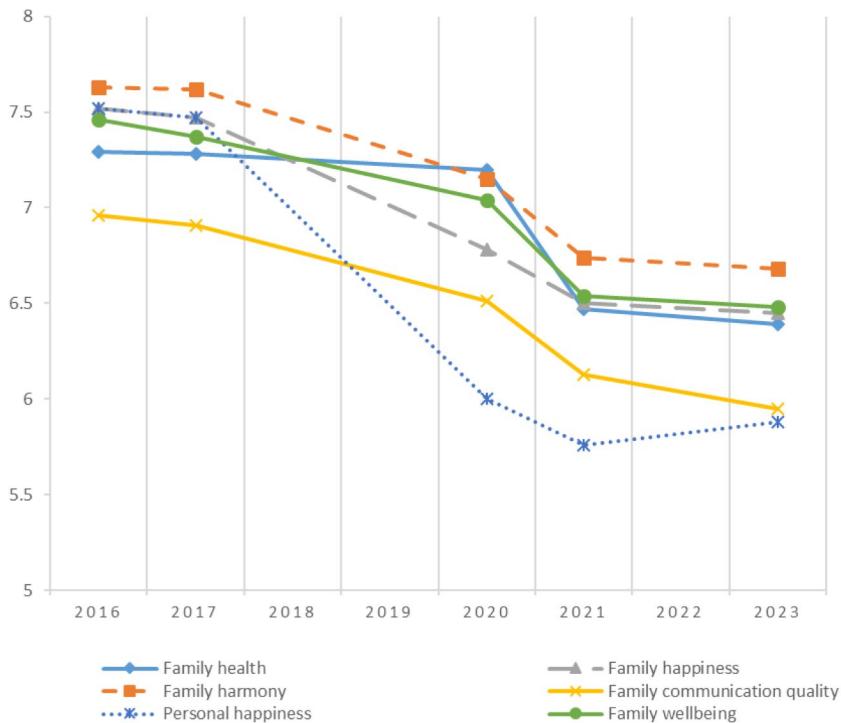


Fig. 1 Trend of family well-being, family communication quality, and personal happiness (mean scores). Weighted by sex and age from census data (2021). The scales range from 0–10

est scores in 2023. The overall decrease corresponds with studies on the pandemic's influence on mental health and quality of life in various populations, resulting from heightened psychological stress, social isolation, and financial difficulties (Brooks et al., 2020; Holmes et al., 2020; Pierce et al., 2020). We examined well-being disparities repeatedly before, during, and after the pandemic, while similar disparities have been observed in other aspects of life, such as access to healthcare, education, and employment opportunities (Bambra et al., 2020; Planchuelo-Gómez et al., 2020; Shevlin et al., 2020). The pandemic and its aftermath disproportionately impacted specific groups, such as those with lower income and education, and worsened pre-existing social inequalities (Patel et al., 2020; Selden & Berdahl, 2020). Our findings emphasize the importance of understanding the intersections between socioeconomic disparities and their cumulative impact on well-being outcomes. Disparities do not exist independently but rather intersect and intensify one another. For instance, males from low-income backgrounds face compounded disadvantages in education access, affecting employment and financial stability (Heckman et al., 2006; Kane et al., 2006). Income has the strongest impact on family well-being, as it enables access to resources, opportunities, and experiences that foster happiness and enhance self-esteem and social standing (Killingsworth, 2021). While some studies observed a U-shaped relationship between age and well-being, our research found a linear relationship, with older age groups having higher subjective well-being and health

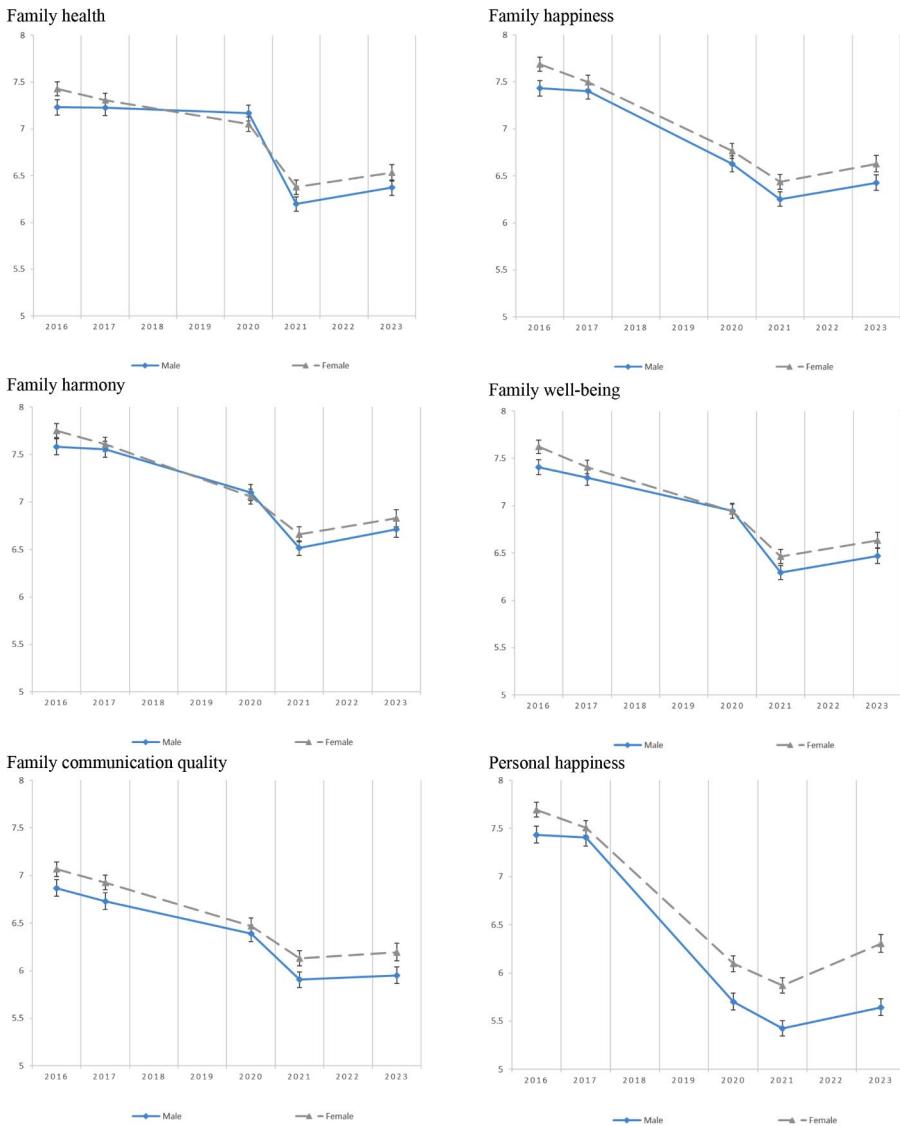


Fig. 2 Trend of family well-being, family communication quality, and personal happiness by sex. Predicted margins (multi-adjusted means), with their 95% confidence intervals represented by plots, adjusted for age, education, and monthly household income. Weighted by sex and age from census data (2021). The scales range from 0–10

(Steptoe et al., 2015). Few studies have analysed older age's role in intersectional factors, finding that higher income and education levels have a marginal impact on well-being scores (Blanchflower & Oswald, 2008).

Research on the association of well-being with socioeconomic factors in the general population is limited, as previous studies have predominantly focused on specific populations or assessed well-being outcomes about psychosocial or health

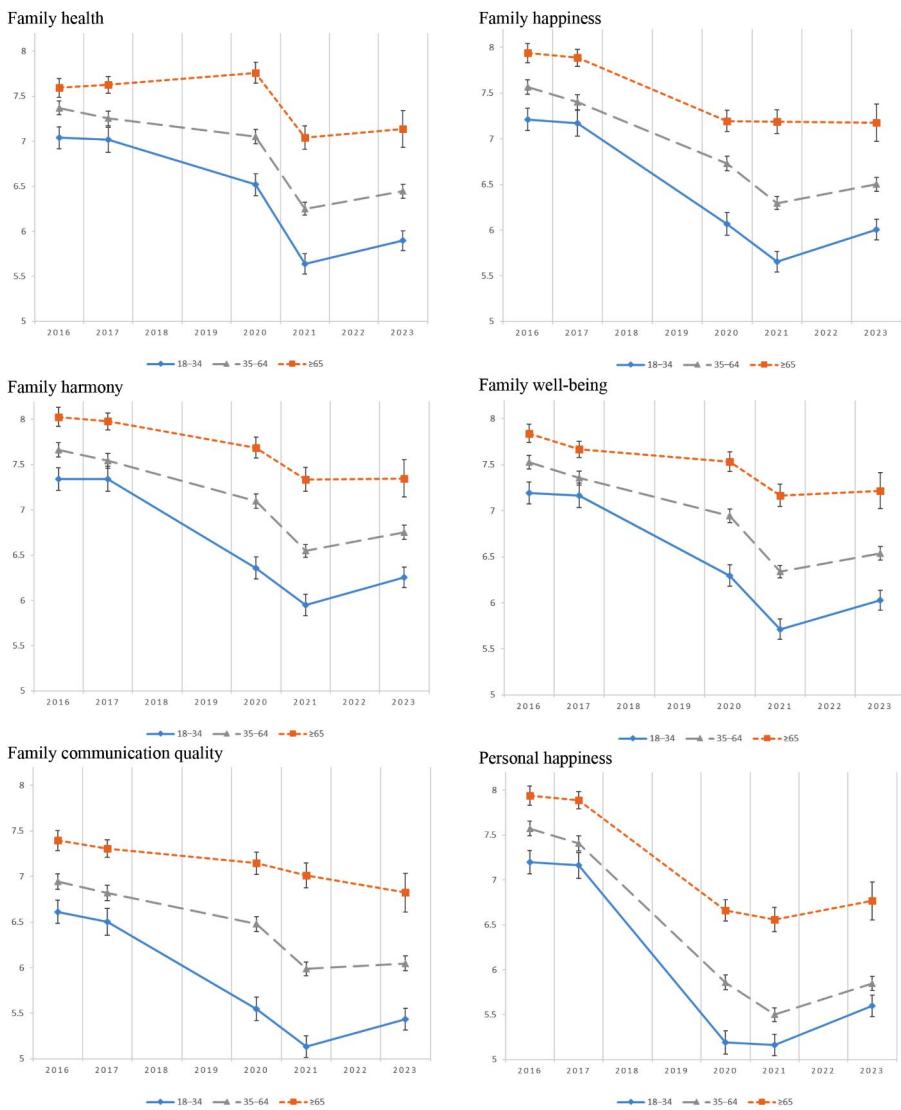


Fig. 3 Trend of family well-being, family communication quality, and personal happiness by age. Predicted margins (multi-adjusted means), with their 95% confidence intervals represented by plots, adjusted for sex, education, and monthly household income. Weighted by sex and age from census data (2021). The scales range from 0–10

indicators. The period of 2016–2023 witnessed both narrowing and widening disparities, influenced by various socioeconomic factors and major events. Notably, mean scores of family well-being, family communication quality, and personal happiness declined after 2019 compared to pre-pandemic years, due to the profound effects of multiple external factors, including the 2019 social unrest, the COVID-19 pandemic, and the economic downturn as a result of the pandemic. The 2019 social unrest affected younger individuals more, due to their higher participation and direct

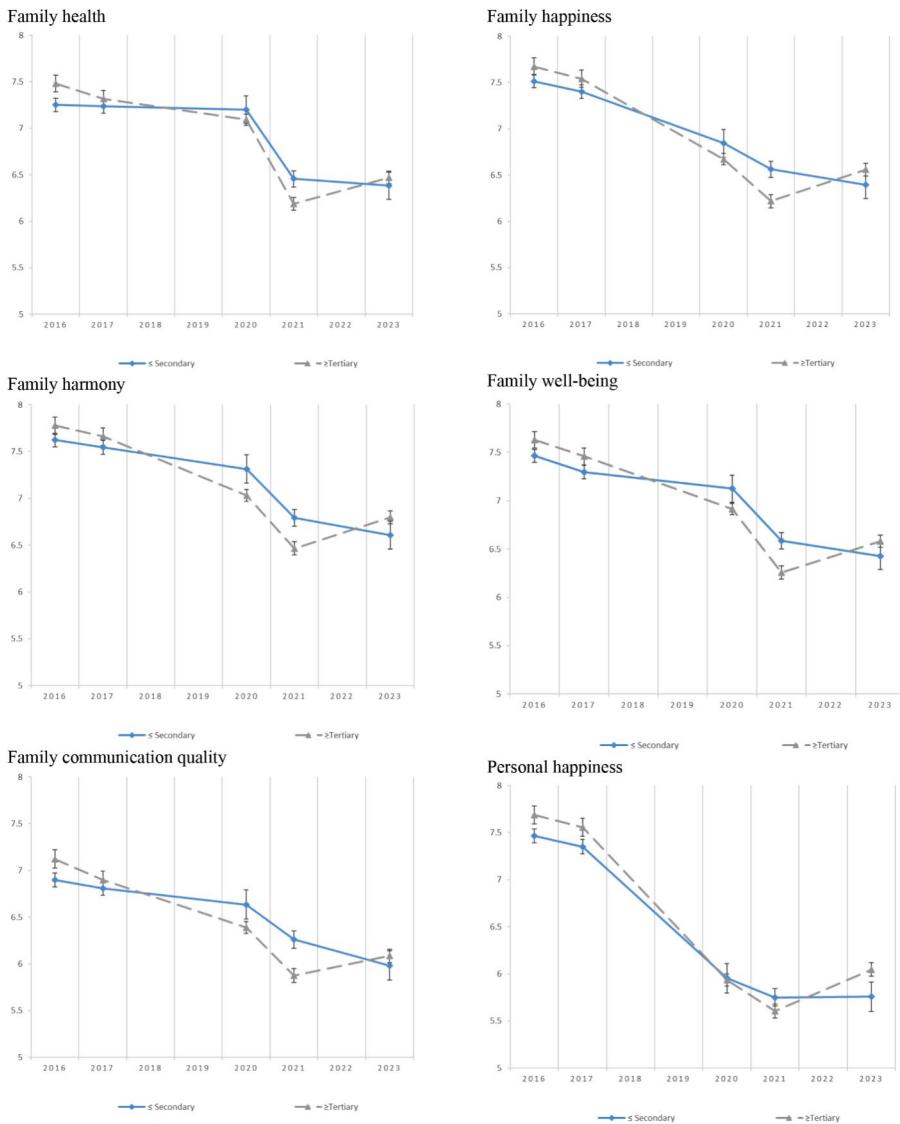


Fig. 4 Trend of family well-being, family communication quality, and personal happiness by education. Predicted margins (multi-adjusted means), with their 95% confidence intervals represented by plots, adjusted for sex, age, and monthly household income. Weighted by sex and age from census data (2021). The scales range from 0–10

impacts (Shek, 2020). COVID-19 disproportionately heightened stress and anxiety in younger individuals, while lower-income individuals encountered increased job loss, income reduction, and limited resource access (Varma et al., 2021; Wanberg et al., 2020). Our findings indicate that family well-being and family communication quality dropped by 12.3–14.5%, and personal happiness declined by 21.8% from 2016 to 2023. The decline was most noticeable among those with low monthly household

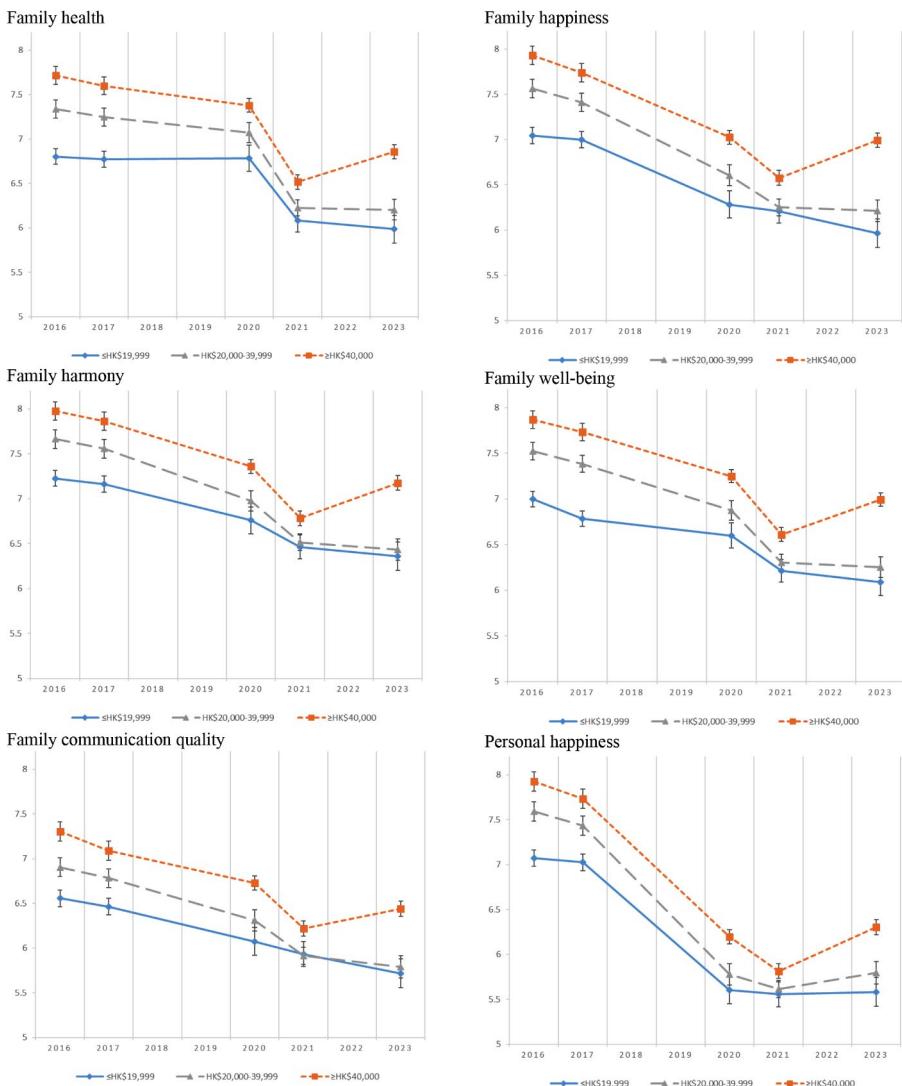


Fig. 5 Trend of family well-being, family communication quality, and personal happiness by monthly household income. Predicted margins (multi-adjusted means), with their 95% confidence intervals represented by plots, adjusted for sex, age, and education. Weighted by sex and age from census data (2021). The scales range from 0–10

incomes, indicating that economic factors mainly drive the widening disparities. The economic downturn has exacerbated existing inequalities, making life more challenging for the majority. Only the wealthiest seem to be exempt, further contributing to the overall decline in outcomes. This decline in well-being continued even after COVID-19 in 2023, and the inverse associations between monthly household income and well-being in the middle-income group observed in 2021 did not re-emerge in 2023, suggesting a potential COVID-specific influence on these connections.

Table 2 Associations of socioeconomic factors with family well-being, family communication quality, and personal happiness^a

Sex	Family health				Family happiness				Family harmony				Family well-being				FC ^b quality				Personal happiness				
	Adjusted β		P		Adjusted β		P		Adjusted β		P		Adjusted β		P		Adjusted β		P		Adjusted β		P		
	(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		(95% CI) ^c		
Male	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	
Female	0.1 (0.05, 0.15)	<0.001	0.17 (0.12, 0.23)	<0.001	0.09 (0.04, 0.14)	<0.001	0.09 (0.04, 0.18)	<0.001	0.13 (0.08, 0.24)	<0.001	0.19 (0.13, 0.42)	<0.001	0.19 (0.13, 0.42)	<0.001	0.37 (0.32, 0.42)	<0.001	-	-	-	-	-	-	-	-	
Age, years																									
18–34	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	
35–64	0.47 (0.41, 0.54)	<0.001	0.49 (0.42, 0.56)	<0.001	0.49 (0.42, 0.55)	<0.001	0.49 (0.42, 0.55)	<0.001	0.48 (0.42, 0.55)	<0.001	0.63 (0.56, 0.7)	<0.001	0.63 (0.56, 0.7)	<0.001	0.38 (0.31, 0.45)	<0.001	-	-	-	-	-	-	-	-	
≥65	0.97 (0.89, 1.05)	<0.001	1.01 (0.93, 1.1)	<0.001	1 (0.91, 1.08)	<0.001	1 (0.91, 1.08)	<0.001	0.96 (0.89, 1.04)	<0.001	1.24 (1.15, 1.32)	<0.001	1.24 (1.15, 1.32)	<0.001	1.05 (0.96, 1.13)	<0.001	-	-	-	-	-	-	-	-	
Education																									
≤ Secondary	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	
≥ Tertiary	0 (-0.06, 0.06)	0.956	-0.02 (-0.09, 0.04)	0.472	-0.04 (-0.03)	0.248	-0.01 (-0.07, 0.05)	0.248	-0.01 (-0.07, 0.05)	0.662	-0.05 (-0.12, 0.02)	0.662	-0.05 (-0.12, 0.02)	0.662	-0.05 (-0.12, 0.02)	0.662	-0.05 (-0.12, 0.02)	0.662	-0.05 (-0.12, 0.02)	0.662	-0.05 (-0.12, 0.02)	0.662	-0.05 (-0.12, 0.02)	0.662	-0.05 (-0.12, 0.02)
Monthly household income ^e																									
≤HK\$19,999	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	
HK\$20,000–39,999	0.38 (0.31, 0.45)	<0.001	0.35 (0.27, 0.42)	<0.001	0.28 (0.21, 0.35)	<0.001	0.28 (0.21, 0.35)	<0.001	0.39 (0.33, 0.46)	<0.001	0.23 (0.15, 0.3)	<0.001	0.23 (0.15, 0.3)	<0.001	0.36 (0.28, 0.43)	<0.001	-	-	-	-	-	-	-	-	
≥HK\$40,000	0.76 (0.69, 0.84)	<0.001	0.78 (0.71, 0.86)	<0.001	0.67 (0.6, 0.75)	<0.001	0.67 (0.6, 0.75)	<0.001	0.8 (0.73, 0.87)	<0.001	0.63 (0.56, 0.71)	<0.001	0.63 (0.56, 0.71)	<0.001	0.71 (0.63, 0.78)	<0.001	-	-	-	-	-	-	-	-	
Year																									
2016	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	
2017	-0.07 (-0.15, 0.01)	0.068	-0.12 (-0.2, -0.04)	0.003	-0.09 (-0.17, -0.01)	0.023	-0.17 (-0.24, -0.1)	0.023	-0.17 (-0.24, -0.1)	<0.001	-0.14 (-0.22, -0.06)	<0.001	-0.14 (-0.22, -0.06)	<0.001	-0.12 (-0.21, -0.04)	<0.001	-	-	-	-	-	-	-	-	

Table 2 (continued)

	Family health		Family happiness		Family harmony		Family well-being		FC ^b quality		Personal happiness	
	Adjusted β		P		Adjusted β		P		Adjusted β		P	
	(95% CI) ^c ^d		(95% CI) ^c ^d		(95% CI) ^c ^d		(95% CI) ^c ^d		(95% CI) ^c ^d		(95% CI) ^c ^d	
2020	-0.23 (-0.32, -0.15)	<0.001	-0.87 (-0.95, -0.78)	<0.001	-0.59 (-0.68, -0.51)	<0.001	-0.58 (-0.66, -0.5)	<0.001	-0.54 (-0.62, -0.45)	<0.001	-1.66 (-1.75, -1.57)	<0.001
2021	-1.05 (-1.13, -0.97)	<0.001	-1.21 (-1.29, -1.13)	<0.001	-1.08 (-1.16, -1)	<0.001	-1.14 (-1.22, -1.06)	<0.001	-0.94 (-1.02, -0.86)	<0.001	-1.91 (-1.99, -1.82)	<0.001
2023	-0.88 (-0.97, -0.8)	<0.001	-1.03 (-1.12, -0.95)	<0.001	-0.9 (-0.99, -0.81)	<0.001	-0.97 (-1.05, -0.89)	<0.001	-0.89 (-0.98, -0.8)	<0.001	-1.58 (-1.67, -1.49)	<0.001

^aWeighted by sex and age from census data (2021)^bFamily communication^cConfidence interval^dMutually adjusted^eUS\$1=HK\$7.8s

While our study presents significant findings, it is important to acknowledge its limitations. Self-reported results were skewed by biases like non-response and social desirability. Its cross-sectional design hinders establishing causality between socio-economic factors and well-being outcomes, necessitating longitudinal studies for determining causality and temporal relationships (Rothman et al., 2008). The large sample size is limited to a single country, reducing the generalizability of findings to other contexts. The relationship between socioeconomic factors and well-being outcomes are context-dependent and influenced by broader societal factors and policies. Future research should include multiple countries for consistency across cultural contexts and focus on interventions addressing the direct influence of socio-economic disparities on family well-being. The surveys' limited representation of older, less-educated, and lower-income individuals affect the result generalizability. However, key variables showed similar outcomes in both unweighted and weighted samples. Despite these limitations, our findings contribute to a greater understanding of the complex interplay between socioeconomic factors and well-being outcomes. Our findings suggest an equity-focused approach to public health interventions is necessary. Such an approach should address sex-based income disparities, age-related challenges, access to quality education, and income inequalities, all of which influence well-being outcomes (Horesh & Brown, 2020). Our study emphasizes the importance of studying the general population, rather than focusing solely on specific populations or well-being outcomes in relation to other psychosocial or health indicators. This broader scope can inform the development of more effective interventions targeting the direct influence of socioeconomic disparities on family well-being. Our study, although not providing immediate feedback on past events, offers valuable insights for future government policies and actions. By understanding the long-term psychological and socio-economic impacts, the government can develop targeted interventions for affected groups. The study highlights social security's importance during economic downturns, recommending policies assisting those with job loss or financial difficulties to mitigate well-being and happiness impacts.

Conclusion

This study found the intricate relation of socioeconomic factors with family well-being, family communication quality, and personal happiness before, during, and after the COVID-19 pandemic and social unrest in Hong Kong. The findings highlighted the importance of adopting a comprehensive approach to well-being that considers multiple dimensions beyond health and happiness.

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Data availability The data presented in this study are available upon reasonable request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Declarations

Ethical Approval The University of Hong Kong/Hospital Authority Hong Kong West Cluster Institutional Review Board.

Conflict of Interest The authors have no competing interests to declare that are relevant to the content of this article.

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