



Changes in Subjective Well-Being and its Mechanisms during Times of Crises in Finland

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Accepted: 25 March 2025
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Abstract

This study examines the impact of the COVID-19 pandemic and subsequent crises on subjective well-being (SWB) in Finland between 2016 and 2022. By examining various measures of quality of life, namely happiness, life satisfaction, perceived stress, loneliness, and economic security, we provide a comprehensive analysis of SWB during the pandemic and subsequent crises, including the social reopening and the Russian invasion of Ukraine. Using a nationally representative survey from 2016 to 2022 ($N=9,936$) and five-wave panel data from 2017 to 2022 ($N=431$), we assessed both cross-sectional and individual-level changes in SWB. Our study focused on three main areas: the evolution and overlap of various dimensions of SWB during the pandemic, variations in SWB across labor market groups, and changes in the impact of the key mechanisms explaining SWB. The results indicate a substantial long-term decline in SWB; overlap between its various dimensions; an accumulation of adverse effects, particularly among students and the unemployed; and a more pronounced association between loneliness and SWB during the period of crisis. Taken together, the results suggest a widening, rather than a narrowing, of inequalities in well-being. This study contributes to the ongoing debate regarding the smoothing effect of crises and enriches the literature on the impact of COVID-19 on well-being with a robust longitudinal and cross-sectional analysis. The results highlight the need for targeted interventions to support vulnerable populations and improve society's resilience to future crises.

Keywords Subjective well-being · Life satisfaction · COVID-19 · Crisis · Inequality · Longitudinal study

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1 Introduction

Historian Scheidel (2017) posited that mass mobilization warfare, transformative revolution, state failure, and lethal pandemics are the Four Horsemen of the Apocalypse and that these have been the “great levelers of inequality” in human history. They have proven to be effective levelers of economic inequality, reducing the power, wealth, and income of the upper strata of society. Thus, when the COVID-19 pandemic ended, one might have assumed that given its impact, inequalities regarding quality of life had decreased. However, particularly from a European perspective, any attempt to assess the pandemic’s long-term consequences is complicated by the fact that a new crisis was already on the horizon. Russia’s invasion of Ukraine in late February 2022 was reflected in the lives of Europeans that same year in the form of the increasing cost of living, high interest rates, and general insecurity and feelings of unsafety (see Guan et al., 2023; Scharbert et al., 2024).

In this article, we examine the impacts of the pandemic, considering its overlaps with other crises of the 2020s. We investigate how individuals’ subjective well-being (SWB) changed in Finland between 2016 and 2022. Thus, our research period includes changes in people’s quality of life brought about by the COVID-19 pandemic, the reopening of society after the restrictions due to the pandemic, and Russia’s invasion of Ukraine. This article provides a comprehensive analysis of the development of SWB during the pandemic and other crisis years by examining a range of measures of quality of life, namely happiness, life satisfaction, perceived stress, loneliness, and economic security.

The main objectives of this study are to *investigate* the evolution of various well-being dimensions during the pandemic, *explore* differences between labor market groups, and *assess* changes in the key factors that influence well-being. The research questions are as follows:

R1) How did various aspects of SWB and the relationships between them change during the pandemic period?

R2) How did social relations and economic security contribute to the differing SWB trajectories observed across various labor market groups during the pandemic?

R3) How did the significance of the major explanatory factors affecting SWB, specifically social relations and economic security, shift during the pandemic?

In a broader context, this research contributes to the ongoing debate regarding whether crises served as a significant leveler of inequality during this period, as suggested by Scheidel’s analyses. Conversely, we contribute to the existing body of research on the effects of COVID-19 on well-being (e.g., DeRose et al., 2023; Fernandes-Urbano & Samuel, Möhring et al., 2021; O’Connor et al., 2020.; Zacher & Rudolph, 2020) by analyzing longitudinal changes in SWB at both the individual and population levels.

Our empirical analysis is based on two datasets that allow us to analyze SWB before the COVID-19 pandemic; during the first year of pandemic, in 2020; and at the transition from 2022 to 2023, when society had already reopened after the pandemic but the war in Ukraine had begun to affect Finns’ quality of life, especially in terms of higher energy prices and other costs of living. First, we used nationally representative Wellbeing and Inequality in Finland (WEBE) surveys collected in 2016, 2017–2018, 2020, and 2022–2023. The data allow us to analyze cross-sectional changes in SWB between 2016 and 2022 as well as changes in SWB differences between population groups. Second, we used the Digital Age in Finland five-wave longitudinal follow-up survey, which was used to collect data from the

same respondents between 2017 and 2022. These data allow us to analyze individual-level changes in SWB and its determinants between 2017 and 2022.

This article proceeds with a review of the prior literature on SWB and the impacts of the pandemic on SWB in various countries. This is followed by a presentation of the research context, Finland, and a summary of prior studies conducted there on this topic. The next section presents the datasets and methods employed to analyze the data, including the survey designs and statistical techniques used. Subsequently, we present our results in relation to the research questions. These include the findings regarding the changes in SWB over time, the impact of social relations and economic security on well-being, and the differences observed across various labor market groups. Finally, we return to the previous literature and interpret the results in relation to previous findings on the pandemic period in other countries. Furthermore, we discuss the relevance of the various phases of the crisis to welfare inequalities.

2 Theoretical Background of Subjective Well-Being

SWB refers to an individual's own evaluation of their life; that is, a high SWB is associated with a positive evaluation, and a low SWB is associated with a negative evaluation (Diener, 1984; Diener et al., 2005). SWB is a multidimensional concept with affective and cognitive dimensions, which are further divided into three components according to a tripartite model: positive affect, negative affect, and life satisfaction (Busseri, 2018; Busseri & Sadava, 2011; Diener,). Empirically, the various components are strongly correlated but have different conceptual bases. Life satisfaction can be understood primarily as a cognitive evaluation of life as a whole and the extent to which people's personal expectations and aspirations are fulfilled (Diener, 1984). Positive affect refers, for example, to happiness and joy, but it is most closely connected with the daily feelings and moods that an individual experiences on a day-to-day basis (Diener et al., 1999; Haybron, 2020). Negative affect, on the other hand, refers to unpleasant daily experiences and the extent to which daily activities cause distress (Busseri & Sadava, 2011).

Together, the various components provide a comprehensive picture of SWB, describing, in a multidimensional way, both the cognitive and affective aspects of an individual's quality of life. The tripartite model of subjective well-being is based on the idea that the components of SWB are interrelated but distinct (Busseri, 2018). Crises can profoundly impact the tripartite model of SWB, particularly the relationships between its components. During crises, feedback loops can create either negative spirals, in which decreased life satisfaction leads to increased negative affect, or positive spirals, in which high satisfaction helps maintain resilience and enhance positive affect (Aknin et al., 2012; Maddux, 2017).

In times of crisis, the explanations and mechanisms of SWB may also take on new meanings. Traditional well-being theories, such as Maslow's (1943) hierarchy of needs and Ryan and Deci's (2000) self-determination theory, highlight the importance of social belonging, meaningful social interactions, and financial security in sustaining well-being. It is widely recognized that high-quality and fulfilling social relationships are crucial to an individual's SWB (e.g., Diener et al., 2018). Social relationships provide emotional support that, for example, acts as a buffer against stress in challenging situations, reducing the harmful effects of stress on mental health (Cohen & Wills, 1985). The functioning of social relation-

ships is also important in satisfying the need to belong (Baumeister & Leary, 1995), which further contributes to SWB. Social interactions provide individuals with positive feelings, such as love, joy, and contentment, contributing to long-term satisfaction (Diener & Seligman, 2002).

In this study, we employ the concept of loneliness to investigate the role of social relationships in the SWB of individuals during a crisis. Loneliness can be defined as a negative subjective experience in which an individual feels anxious about their qualitatively or quantitatively deficient human relationships (Cacioppo & Patrick, 2008). Feelings of loneliness and a lack of social relationships, on the other hand, have been seen as decreasing SWB (Tu & Zhang, 2014; VanderWeele et al., 2012). Loneliness is associated with increased mortality, mental disorders, and psychiatric treatment (Holt-Lunstad et al., 2015; Lasgaard et al., 2016), which undermine the overall SWB of individuals. Further, there are sociodemographic differences in loneliness, with the unemployed, young people and the elderly considered to be at risk (Lasgaard et al., 2016).

In addition to social needs, the satisfaction of economic needs is an important basis for individual-level SWB, although once a certain level of income is reached, additional income does not necessarily increase happiness (Diener & Biswas-Diener, 2002). Financial stability enables individuals to plan for the future and feel secure, which is essential for overall life satisfaction. When individuals experience financial difficulties, they may feel constrained by their circumstances and unable to make autonomous decisions about their lives, such as pursuing personal interests or affording necessities (Butterworth et al., 2009; Kahn & Pearlman, 2006). This financial stress not only affects their sense of security but also undermines their autonomy and competence, further diminishing their overall life satisfaction (e.g., Richardson et al., 2013). Financial instability due to the pandemic potentially disrupted this, causing uncertainty and fear. On the other hand, financial stability and general financial satisfaction can be crucial components of resilience in times of crisis, allowing individuals to focus on other essentials after their key material resources are secured.

3 Previous Research

3.1 A Prolonged Pandemic: an Exceptionally Unequal Period Regarding Subjective Well-Being

Prior studies have indicated that the pandemic's onset had varying impacts on SWB across regions and timeframes. Initial studies highlighted relatively small changes, but as the research progressed, the negative aspects of the results became more pronounced. For example, Shavit et al. (2021) found no significant changes in SWB as compared to pre-pandemic levels in Israel, and a study in Brazil observed similar stability over a longer timeframe, from 2018 to 2020 (Otta et al., 2021). However, a longitudinal study conducted in the US (Wanberg et al., 2020) identified increased depressive symptoms during the early pandemic, which significantly reduced SWB.

Even though the pandemic affected all individuals, certain demographic groups were more susceptible to its adverse effects, particularly when it coincided with other crises. Previous research has identified strong correlations between both unemployment and student status and a decline in SWB during the pandemic. This phenomenon has been observed

across diverse geographical regions and timeframes. In Germany, those living alone reported a decline in satisfaction with family and work at the onset of the pandemic (Möhring et al., 2021). In Japan, SWB decreased slightly at the pandemic's onset and remained stable thereafter, with especially pronounced declines being observed among the unemployed (Sudo, 2022). A significant decline in SWB was observed among students in Turkey and Germany because of the implementation of lockdown measures (Gundogan, 2023).

The pandemic has also provided an opportunity to study the operation of various SWB mechanisms. The prolonged and unique stressors of the pandemic have likely amplified various effects, making it particularly important to explore this relationship (Banerjee et al.; Killgore et al., 2020). According to the stress-buffering hypothesis, social support can mitigate the harmful effects of stress on mental health and well-being (Cohen & Wills, 1985). Previous research partially supports the idea that social relationships act as a buffer against a decline in SWB and may even enhance it during certain moments of crisis. In Latin America, life satisfaction increased between the first and second years of the pandemic, which was attributed to increased social interaction (Sarmiento Prieto et al., 2023). Similarly, in the United Kingdom, social support predicted higher SWB during the pandemic (Mao et al., 2024), highlighting the importance of social factors in maintaining SWB. In the Netherlands, working from home was positively associated with high SWB (Kroesen, 2022), as people had more time for family and close friends during the early stages of the pandemic than they had previously.

Second, research has demonstrated that economic security is a significant factor in determining SWB during the pandemic. An international study conducted across 43 countries found that income levels were associated with increased happiness during a crisis (Muresan et al., 2023). Employment and job security also played protective roles, with the well-being of self-employed individuals in the UK declining significantly at the onset of the pandemic (Yue & Cowling, 2021). Wanberg et al. (2020) demonstrated that a low income level was associated with elevated depressive symptoms and, consequently, a reduction in SWB.

Previous research has thus identified the key role of economic security and social relationships, on one hand, and labor market status, on the other, in SWB in times of crisis. However, little is known about the interplay between these factors or the extent to which economic status and social relationships moderate or mediate the effect of labor market status. Limited attention has been given to these factors during the various phases of the crisis or the variation in their longitudinal relationships. Other studies have shown that welfare-related changes are mostly localized as a crisis drags on (Claes et al., 2023). It is also possible that the impact of mechanisms will differ as the crisis progresses.

3.2 Finland as a Context: the Happiest Country in the World

Finland, consistently ranked by the *World Happiness Report* as the happiest country in the world, serves as an illustrative case via which to study the evolution of subjective well-being in times of crisis. A government report on the societal impacts of the COVID-19 crisis in Finland concluded that Finland managed relatively well regarding medium-term impacts. Finland had lower infection and mortality rates than many other European countries, and it adopted relatively mild containment measures. The Finnish economy recovered well, and in particular, employment developed well after the pandemic (Varanka et al., 2025). Also, evaluations of Finnish welfare policy responses to the pandemic have shown that the coun-

were collected between April and June 2016 ($N=2,534$), between November and February 2017–2018 ($N=2,402$), between September and December 2020 ($N=2,700$), and between December and January 2022–2023 ($N=2,300$). The surveys were collected through telephone interviews, although a supplementary internet panel for people under 35 ($N=501$) was added to the 2022 survey. The 2016 sample was partitioned according to gender, age, and NUTS 3 region, while the samples for 2017, 2020, and 2022 were partitioned according to NUTS 3 alone. In the analyses, post-stratification weights were used, which corrected the representativeness of the data according to age and gender. We removed those respondents who had not answered the questions regarding the variables from Table 2 and A1. Additionally, in the models, we controlled for the survey format, as some of the responses in 2022 were collected through an online survey.

4.1.2 Digital Age in Finland Longitudinal Survey

The second dataset is derived from the *Digital Age in Finland* (DAF) longitudinal survey, which tracked the same participants from 2017 to 2022 across five measurement points (see Koivula et al., 2020, for more details). The first data collection (T1) took place in December 2017, with the final phase spanning from December 2022 to January 2023. The first dataset comprised two separate samples of Finns aged 18–74, with a total of 3,724 participants. Of these, 66% were recruited through the population register and received a letter with a paper questionnaire, while 34% were recruited from an online panel managed by Taloustutkimus Oy. The total response rate for this first phase was 30.8%.

Subsequent phases of the survey were conducted exclusively online, with participants being invited by e-mail. During the second phase (T2), conducted in spring 2019, 1,134 responses were received, representing 30.5% of the T1 respondents. The third phase (T3) took place in May–June 2020, during the first wave of the COVID-19 pandemic, and 735 responses (64.8% of T2 respondents) were received. The fourth phase (T4) took place in December 2021, with 543 responses being received (73.9% of T3 respondents). The final phase (T5) was conducted in December 2022, with 431 responses (79.4% of T4 respondents). Only those who participated in all five measurement points were included in the final analysis, resulting in a total of 2,155 observations of 431 individuals.

For this study, we included only those individuals who participated in all five measurement points. The data were slightly skewed toward males, the aged, and highly educated individuals. We adjusted for this skewness and attrition using poststratification weights

Table 2 Research design by research questions

Research question	Data	Methods
RQ1) How various aspects of well-being and the relationships between them have changed throughout the pandemic period.	WEBE	Cross-tabulation, OLS regression
RQ2) How social relations and economic security contribute to the differing well-being trajectories observed across various occupational groups during the pandemic.	WEBE	Between individuals OLS regression with interactions
RQ3) How the significance of major explanatory factors of well-being, specifically social relations and economic security, has shifted during the pandemic.	DAF	Random effects within-between models

based on the population-level distributions of age, gender, and education. We began by calculating weights based on age and gender and then adjusted them further by multiplying them by weights for educational level (Deville & Särndal, 1992).

4.2 Measures

4.2.1 Subjective Well-Being, Loneliness, and Economic Situation

We studied the multidimensionality of SWB using the WEBE study and three items: happiness, life satisfaction, and feelings of stress in life. *Happiness* was measured using the following question: “How often have you felt happy during the last 12 months?” The response options were based on a 5-point scale from “never” to “constantly.” *Life satisfaction* was measured by a question measuring subjective general satisfaction: “Both good and bad things happen in life. When you think about your life today, how satisfied or dissatisfied are you with your life?” Respondents were asked to rate their life satisfaction on a scale ranging from 0 (dissatisfied) to 10 (satisfied). *Feelings of stress in life* were measured based on the statement “My life is currently so stressful that I am unable to make long-term plans,” with response options ranging from “strongly agree” to “strongly disagree” on a 5-point scale. In the longitudinal analysis, we focus on life satisfaction as a measure of SWB. In the DAF study, life satisfaction was measured using a single-item measure that asked respondents “How satisfied are you with your life?” on a scale from 0 (extremely dissatisfied) to 10 (extremely satisfied).

In each study, loneliness was measured using a single item. In the WEBE study, respondents were asked, “In the past 12 months, how often have you felt lonely?” Answers were based on a 5-point scale (1=Never, 2=Very rarely, 3=Sometimes, 4=Quite Often, and 5=Always). In the DAF study, loneliness was assessed using the question “Are you lonely?” Answers were based on a 5-point scale (1=Never, 2=Rarely, 3=Sometimes, 4=Often, and 5=Always). In the WEBE study, we further dichotomized the loneliness variables as individuals who were lonely (Often or always) and those who were not lonely (Never, Very rarely, or Sometimes).

The subjective economic situation was measured using the traditional question on the ability to make ends meet in the WEBE study: “Taking all the income in your household into account, does it cover your usual expenses?” The response options, which were based on a 6-point scale, ranged from “With great difficulty” to “Very easily.” In the DAF study, we measured an individual’s economic situation in terms of their current financial satisfaction on a scale from 0 (Very poor) to 10 (Very good).

As a reflection on the measurement of SWB and other time-variant subjective measures, it is worth noting that these measures differ in terms of the point in time at which the respondent was asked to evaluate their situation. While measures of one’s life satisfaction, feelings of life stress, and economic situation concern the current situation, the respondents were asked to assess their experiences of happiness and loneliness during the previous 12 months. In this study, we assume that changes in SWB are due to prior events close to the time of the survey. This is suggested by studies that recognize the dynamic nature of SWB, emphasizing both the stable and the fluctuating characteristics of SWB (Luhmann et al., 2021). Thus, we assume that the COVID-19 pandemic and subsequent crises (Table 1) have acted as life events and are reflected in people’s specific feelings.

4.2.2 Demographic Variables

Labor market status was used as a moderator in the first stage of analysis conducted using the WEBE survey. Initially, it was explored using the question “Which of the following groups do you currently belong to?” The following answer options were provided: (1) Student, (2) Pensioner, (3) Unemployed, (4) In paid work, (5) Entrepreneur, (6) Farmer, and (7) Other. We further combined those in paid work, entrepreneurs, and farmers into the single category we termed “Employed.” The “Other” group included, for example, those in military or civilian service and those on parental leave. As this group was not easily defined and made up only approximately 3% of our observations, we do not include this group in the figures representing our main analyses, although it is included in the regression models.

Moreover, we included four other demographic variables when modelling the changes in the SWB indicators based on the WEBE study. Gender was a dichotomous variable with values of (1) Male and (2) Female. There were two respondents who answered that their gender was “Other” in the 2022 dataset, but we excluded these from our analyses. We applied age as a continuous variable, and it ranged from 18 to 79 years. We also added quadratic age to our regression models to account for age-specific variations between our independent variables. For level of education, we asked “What is the highest level of education you have completed?” The following answer options were provided: (1) Secondary or elementary school, (2) High school, (3) Vocational education, (4) Lower university degree, and (5) Higher university degree. We further categorized education into three groups: (1) Basic education; (2) Secondary education, including high school and vocational education; and (3) Tertiary education, including a university degree. Household type had six answer options: (1) Living alone, (2) Single parent, (3) Couple without children, (4) Couple with children, (5) Living with parents, and (6) Other. Due to the small number of observations, we included those living with parents in the “Other” group.

When analyzing longitudinal associations using the DAF data, we considered similar factors that might be relevant to SWB during the study period. First, we considered time-invariant factors, such as gender, as a dichotomous variable, and year of birth between 1943 and 1999. In addition, we considered time-varying socioeconomic factors, such as education and labor market status, using variables like those used in the WEBE survey. Finally, as we did not have a measure of household type from each round, we included partnership status in the models, that is, whether the respondents were in a relationship or not at the time of observation. The descriptive statistics for the applied variables are shown in Table A1.

4.3 Methods

Our analytical strategy via which we attempt to answer the research questions is presented in Table 3. The study was divided into three parts, with the results from two datasets being presented for each of the research questions. First, we described the overall changes in SWB based on cross-tabulations using three dimensions of SWB: life satisfaction, happiness, and feelings of stress in life. We also analyzed these changes with ordinary least squares regression models. Second, we conducted a series of year-level interaction models examining the associations between life satisfaction and both loneliness and economic situation over the 2016–2022 period across labor market groups. In these latter models, we controlled for gender, age, age squared, education, survey type, and household type. We plotted the inter-

Table 3 Changes in feelings of happiness, stress of life and life satisfaction in Finland, 2016–2022 (%)

	2016		2017		2020		2022	
	N	%	N	%	N	%	N	%
Happiness	2 492	100			2 615	100	2 185	100
Never	14	0.6			44	1.7	35	1.6
Very rarely	73	2.9			164	6.3	239	10.9
Sometimes	354	14.2			377	14.4	643	29.4
Quite often	1 603	64.3			1 512	57.8	1 128	51.6
Constantly	448	18.0			518	19.8	140	6.4
Life is stressful			2 347	100	2 615	100	2 185	100
Fully disagree			1 156	49.3	1 557	59.5	474	21.7
Partly disagree			530	22.6	378	14.5	477	21.8
Neither agree or disagree			323	13.8	263	10.1	468	21.4
Partly agree			206	8.8	253	9.7	554	25.4
Fully agree			132	5.6	164	6.3	212	9.7
Satisfaction with life	2 492	100	2 347	100	2 615	100	2 185	100
Mean / Sd	8.2	1.3	7.9	1.4	8.1	1.4	6.8	2.1

actions using the `mplotoffset` command in Stata 18 software. The initial regression models are shown in Table A2 in the Appendix.

Third, we considered that the DAF data were hierarchical, with the responses being nested within individuals. We used random effects within-between (REWB) models (Bell et al., 2019) to find both within individuals and between individuals effects while controlling for relevant covariates. At the within-individuals level, we analyzed only observed changes in the independent variables over time, considering the effect of deviations from the respondent-specific mean. At the between-individuals level, we considered all potential observations by analyzing the effect of the respondent-specific means. In this study, we used this method to examine how changes and differences in the independent variable predicted changes in the dependent variable during the pandemic period (2020–2022) as compared to the pre-pandemic period. To do this, we included interaction terms between the independent variables (loneliness and financial satisfaction) and the period variable that separated the pandemic years (2020, 2021, and 2022) from the pre-pandemic years (2017 and 2019). We conducted the REWB analysis using Stata 18 and the mixed command, following the procedure outlined by Schunck (2013).

5 Results

5.1 Changes in Subjective Well-Being

Table 2 shows the descriptive statistics for changes in SWB, as measured based on happiness, perceived stress, and life satisfaction. Irrespective of the measure used, the results indicate that Finns' SWB deteriorated during the study period. In particular, the changes between the first pandemic year (2020) and the pre-pandemic period (2016–2017) were smaller than those between 2020 and 2022.

Before the pandemic, in 2016, 82% of respondents reported feeling happy all the time or quite often. By 2020, this proportion had fallen slightly. Interestingly, the extremes of the

happiness distribution showed significant changes. In 2020, both the proportions of those who felt happy all the time and those who felt happy rarely or never increased as compared to 2016, suggesting increasing polarization regarding happiness. The most significant change occurred after the pandemic. In 2022, only 58% of respondents reported feeling happy all or most of the time—a significant decrease from 2020. The proportion of those who felt happy all the time fell from 20 to 6%, while those who rarely or never felt happy increased significantly, from 8 to 12%.

A similar trend was observed for life satisfaction. Previous research has shown an increasing trend in Finnish life satisfaction before the COVID-19 pandemic (Kainulainen et al., 2018). Table 2 shows that life satisfaction did not decrease during the pandemic but did decrease significantly between 2020 and 2022. The dispersion of the distribution increased, with a notable change in the most frequent response options. While 8 remained the most frequent response, the second most frequent response changed from 9 during previous periods to 7 in 2022.

The findings on life stress were in line with the trends observed for happiness and life satisfaction. Between 2017 and 2022, the proportion of respondents who fully or partially agreed that their life was so stressful that it was difficult to make long-term plans increased from 14.4 to 16%. However, there was also polarization in this regard; the proportion of those who disagreed with the statement increased from 71.9 to 74%, with the percentage of those who completely disagreed increasing by 10 points, leading “completely disagree” to become the most common response by 2020. By 2022, reflecting the overall decline in SWB, the proportion of respondents who strongly agreed or somewhat agreed that their lives were so stressful that it was difficult to make long-term plans increased to 35.1%. The distribution of the responses became more even, with “partly agree” replacing “totally disagree” as the most common response. Furthermore, we analyzed these changes with OLS regression models. These results shown in Table 4 highlight the fact that regardless of gender, age, household type, labor market status, and survey mode, life satisfaction and happiness were higher and, correspondingly, life was less stressful before 2022.

Next, we examined the relationships between these variables and their evolution over the study period. Understanding these evolving dynamics is crucial in assessing changes in well-being. Figure 1 shows predicted life satisfaction based on levels of happiness and perceived stress over three time periods: 2016–2017, 2020, and 2022. The left panel, which illustrates the relationship between happiness and life satisfaction, shows a consistently positive correlation over all the periods examined. This relationship was more pronounced in 2022, with life satisfaction increasing significantly as happiness increased. The right panel illustrates the relationship between perceived stress and life satisfaction and shows a negative correlation in all periods. In 2022, however, this negative effect was much stronger, with a steeper decline in life satisfaction being observed as perceived stress increased. These temporal variations highlight the fact that the relationships between the dimensions of SWB became more significant in 2022.

5.2 Changes in Life Satisfaction across Labor Market Groups Due To Loneliness and Economic Situation

To answer our second research question, we now focus on how life satisfaction changed across labor market groups due to loneliness and economic situation. For the following

Table 4 Predicting satisfaction of life, happiness and life is stressful according to the survey time, labor market status and control variables. The OLS models

	Satisfaction of life		Happiness		Life is stressful	
	B	SE	B	SE	B	SE
Year (ref. 2022)						
2016	1.049***	0.055	0.408***	0.027		
2017	0.808***	0.056			-0.685***	0.043
2020	0.903***	0.058	0.340***	0.029	-0.797***	0.045
Gender (ref. Male)						
Female	0.194***	0.034	0.115***	0.021	0.026	0.035
Age	-0.067***	0.009	-0.028***	0.005	0.030***	0.009
Age # Age	0.001***	0	0.000***	0	-0.000***	0
Household type (ref. Couple, children)						
Living alone	-0.587***	0.047	-0.320***	0.028	0.202***	0.046
Single parent	-0.659***	0.12	-0.322***	0.058	0.441***	0.128
Couple, no children	-0.086*	0.04	-0.062*	0.026	-0.005	0.044
Other	-0.772***	0.106	-0.284***	0.065	0.041	0.097
Labor market status (ref. Employed)						
Student	-0.142	0.081	0.007	0.047	0.072	0.083
Pensioner	-0.539***	0.077	-0.159***	0.047	0.376***	0.071
Unemployed	-1.030***	0.096	-0.246***	0.05	0.622***	0.08
Other	-0.195	0.107	-0.015	0.057	0.296**	0.1
Survey mode (ref. Phone interview)						
Internet survey	-0.708***	0.116	-0.117*	0.05	0.233**	0.078
Intercept	8.531***	0.218	4.268***	0.135	2.044***	0.22
N	9639		7292		7147	
R²	0.166		0.101		0.113	

Standard errors in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

analysis, we conducted between-individual analyses with the OLS models using the WEBE study. The results of our regression analysis are shown in Table A2. Figure 2 shows the temporal differences for and the differences in the relationships between loneliness, making ends meet, and life satisfaction across labor market groups (students, pensioners, the unemployed, and the employed) over 2016, 2017, 2020, and 2022. The top-left panel shows trends in overall life satisfaction across labor market groups. Students showed a significant decline in life satisfaction over time, with a sharp drop in 2022, as indicated by the steep slope and nonoverlapping confidence intervals. Pensioners showed a slight decline but more stability, with overlapping confidence intervals, indicating less pronounced changes compared to students. The unemployed group showed the largest decrease in life satisfaction, especially in 2022. The employed group also showed a downward trend, with a sharp decline in 2022, although the change was less steep as compared to that observed for the unemployed group.

The top-right panel illustrates the perceived ability to make ends meet across labor market groups. Students experienced a decline in this regard between 2017 and 2020. However, the figure shows no difference for students between 2020 and 2022. Pensioners showed fluctuations, with an overall decreasing trend, and the steepest decrease occurred in 2022, with confidence intervals indicating statistical significance. The unemployed faced a significant



Fig. 1 Life satisfaction according to happiness and perceived stress in the different time periods, predicted values from the regression models

decrease in their ability to make ends meet, especially in 2022, with non-overlapping confidence intervals, indicating a significant decrease. The employed group showed a similar pattern to that of the unemployed group, with a notable decline in 2022 and confidence intervals suggesting a significant change. Interestingly, the largest drop for students occurred between 2017 and 2020, whereas for other groups, the largest drop occurred between 2020 and 2022.

The bottom panel shows trends for loneliness among the labor market groups. Students demonstrated an increasing trend for loneliness, peaking in 2022, with non-overlapping confidence intervals, indicating a significant increase. Pensioners experienced a gradual increase over time, which was more pronounced in 2022, with confidence intervals suggesting statistical significance. The unemployed group showed a significant increase in loneliness, particularly in 2022, when a sharp increase was marked by nonoverlapping confidence intervals. Employed individuals exhibited a moderate upward trend, with a noticeable increase in 2022, and the confidence intervals indicated statistical significance.

We then analyzed the relationship between life satisfaction and loneliness across labor market groups. Figure 3 compares the difference in life satisfaction between the lonely and not lonely groups in various years. The baseline at life satisfaction 0 refers to the not lonely group. The analysis showed a consistent pattern, with individuals who were not lonely reporting significantly higher life satisfaction than their lonely counterparts across all groups and years, as shown by the distinct lines in each graph. The general trend showed a peak in life satisfaction around 2020, followed by a decline in 2022 for both those who were lonely and those who were not. This difference was particularly pronounced among students, as lonely individuals showed a steep decline in life satisfaction from 2020 to 2022.

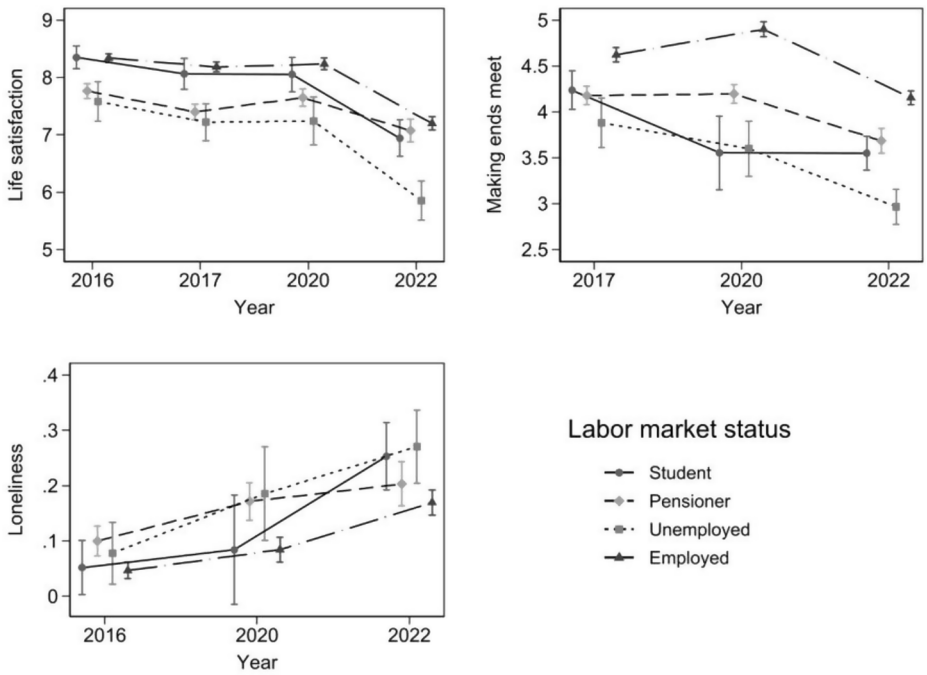


Fig. 2 Temporal changes in life satisfaction, loneliness and making ends meet by labour market status. Predicted values from regression models presented in Table A2

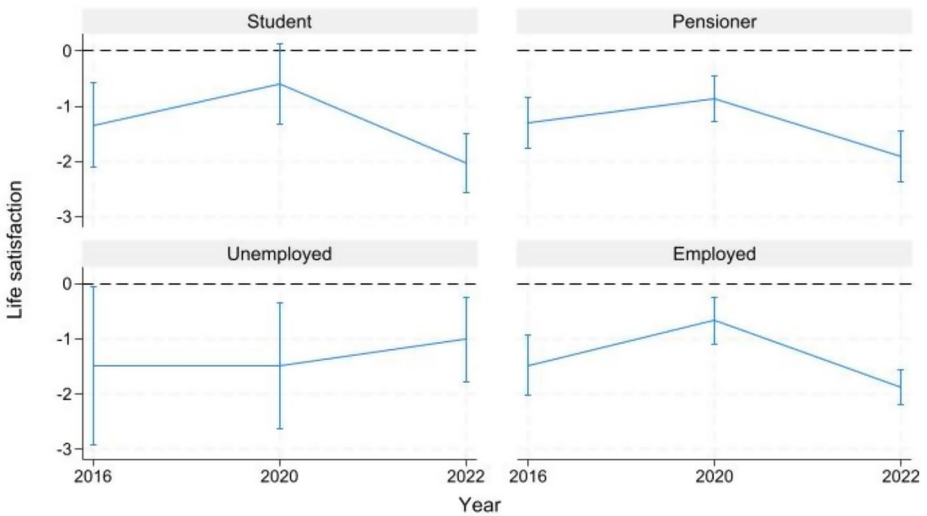


Fig. 3 Temporal changes in life satisfaction according to loneliness by labour market status. The line presents the lonely individuals and the baseline 0 the not lonely individuals. Predicted values from regression models are presented in Table A2

Differences between 2020 and 2022 were evident within each group, especially for lonely individuals. It is also important to note that the gap between those who were lonely and those who were not increased in the final period among students, employed individuals, and pensioners. Within the unemployed group, however, the differences between those who were lonely and those who were not remained similar over the years. However, the difference in the association between loneliness and life satisfaction from 2020 to 2022 is statistically significant only between the employed and unemployed groups (Table A2).

Finally, we studied how life satisfaction changed across labor market groups due to the economic situation between 2017 and 2022. Figure 4 shows the average effect of making ends meet on life satisfaction in all labor market groups during the 2016–2022 period. The results show that across all groups, the effect of making ends meet on life satisfaction has increased. Interestingly, the effect of making ends meet remained relatively stable between 2016 and 2020, but we can observe a peak between 2020 and 2022. However, for the unemployed, we can see a linear increase between 2016 and 2022. As was the case with loneliness when considering economic situation, it seems that the effect of making ends meet on life satisfaction increased the most for students. However, there are no statistically significant differences in the effect of making ends meet on life satisfaction across labor market groups (Table A2).

5.3 Longitudinal Changes in Subjective Well-Being Due To Loneliness and Financial Satisfaction

Regarding the third research question, longitudinal data analysis (DAF) was used to examine whether the impact of loneliness and financial satisfaction on life satisfaction differed between the pandemic and pre-pandemic years. The results are presented in Table 5. The results of the first model indicate that increases in loneliness within individuals are negatively associated with life satisfaction. Specifically, an observed increase in loneliness

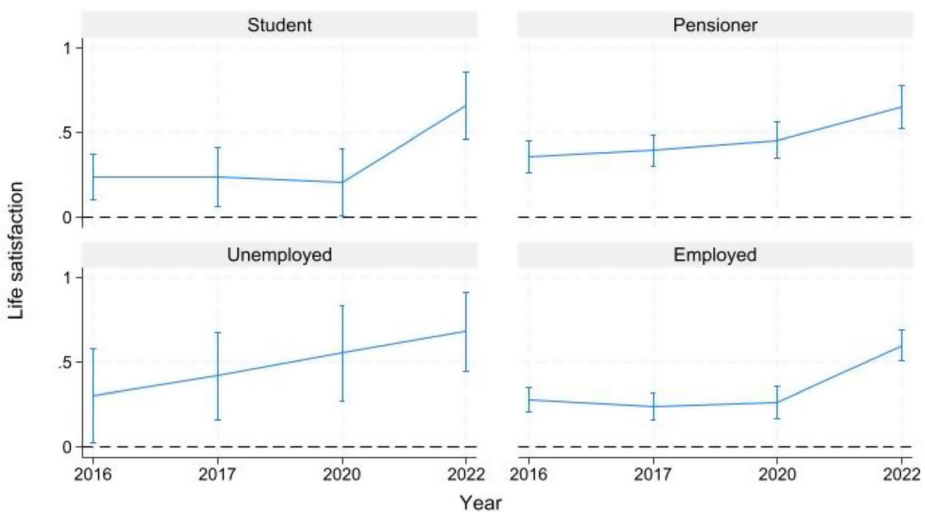


Fig. 4 Temporal changes in the effect of making ends meet on life satisfaction by labour market status. Predicted values from regression models presented in Table A2

Table 5 The effects of increased loneliness and financial satisfaction on life satisfaction (2017–2022): the random effects within-between models

Variables	M1		M2	
	B	SE	B	SE
<i>Within-level</i>				
Pandemic period (ref: pre-pandemic period)	0.00	(0.13)	-0.09	(0.15)
Loneliness	0.48***	(0.11)		
Pre-pandemic period * Loneliness	Ref.			
Pandemic period * Loneliness	-0.33*	(0.17)		
Financial satisfaction			0.16**	(0.05)
Pre-pandemic period * Economic satisfaction			Ref.	
Pandemic period * Economic satisfaction			0.04	(0.06)
<i>Between-level</i>				
Loneliness	-1.42***	(0.11)		
Pre-pandemic period * Loneliness	Ref.			
Pandemic period * Loneliness	-0.02	(0.07)		
Financial satisfaction			0.51***	(0.05)
Pre-pandemic period * Financial satisfaction			Ref.	
Pandemic period * Financial satisfaction			-0.04	(0.03)
Random-effect parameters				
Intercept	1.55	0.17	1.85	0.23
Residual	1.17	0.08	1.25	0.09
ICC	0.57	0.03	0.60	0.03
Observations	2,089		2,099	
Number of individuals	431		431	

Standard errors in parentheses
 *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Models control for gender, birth year, partnership status, main activity and education level

Post-stratification weighted by gender, age and education

corresponds with a decrease in life satisfaction over the study period. Furthermore, the between-level analysis reveals that individuals who were generally lonelier experienced a more pronounced decline in life satisfaction.

Interaction effects with period show that the within-level association between loneliness and life satisfaction was significantly stronger during the pandemic period of 2020–2022 as compared to pre-pandemic period of 2017–2019. However, this interaction effect was not observed when examining the associations between respondents. The interaction results indicate that the negative association between loneliness and life satisfaction was more pronounced during the pandemic but that, on average, lonely people were no more dissatisfied with their lives during the pandemic than before it.

The results of the second model indicate that increased financial satisfaction predicts higher life satisfaction over the study period at both the within-individuals and between-individuals levels. However, the interaction effects reveal that these associations were no stronger during the pandemic period as compared to the pre-pandemic years.

6 Discussion

In this study, we examined the development of SWB among Finns during the pandemic years. Our analysis covered both the pre-pandemic period and various phases of the pandemic, and it used various measures and examined various factors that may influence SWB. Overall, the results show more pronounced changes due to long-term pandemic effects than due to contemporaneous effects during the first wave of COVID-19. It is important to emphasize that the post-acute pandemic phase was characterized by other crises related to the aftermath of the pandemic.

Regarding our first research question, we found that Finns' SWB decreased based on several measures as the pandemic progressed, especially when it coincided with other crises, such as the war in Ukraine at the end of 2022. However, there were no significant changes in SWB during the first pandemic year (2020). In this respect, the results support previous findings indicating that the effects of the pandemic were particularly noticeable in the long term (Claes et al., 2023). In addition to the influence of the pandemic, the delayed effects can be attributed to cumulative stress and ongoing uncertainty, which were exacerbated by additional crises. The results show that well-being had declined across various measures by the end of 2022. In addition, our results showed that the links between the various dimensions of SWB were strengthened as the crises continued. This demonstrates the reinforcing nature of the "feedback loop" associated with well-being during crises, suggesting that high satisfaction in one domain can protect against declines in happiness and increases in stress (Aknin et al., 2012; Diener et al., 2018; Maddux, 2017).

To answer the second research question, we continued to explore the distribution of SWB across labor market statuses. Previous research has suggested that students and the unemployed experienced the most significant declines in SWB during the pandemic (O'Connor et al., 2020). Our findings support these prior observations, showing that differences in SWB between labor market groups became more pronounced as the crisis continued. Interaction analyses between loneliness and financial situation expanded our interpretation; the importance of social connections and financial stability was especially high among students. Good social relationships and secure financial situations protected various groups from declines in SWB as the crisis persisted. This highlights the buffering effect of these factors during prolonged crises.

For the final research question, we examined the mechanisms of SWB and its changes during the crisis. Using panel data, we examined how respondents' experiences of loneliness and financial satisfaction were reflected in the development of their life satisfaction over the course of pandemic. The results show that these key determinants of well-being were critical over the crisis period. This suggests that those with strong social relationships and good economic situations fared better than those without them during the crisis. Conversely, those who often experienced loneliness and were dissatisfied with their economic situations suffered the most (Baumeister & Leary, 1995; Diener & Seligman, 2002). An interaction analysis indicated that individual-level changes in loneliness were more strongly associated with life satisfaction during the pandemic than before the pandemic. This finding lends further support to the notion that social ties are of considerable significance during periods of crisis (Sarmiento Prieto et al., 2023; Mao et al., 2023). However, our results also revealed that the impact of financial satisfaction on SWB does not increase during such periods.

Overall, our findings do not provide clear support for the view that crises reduce inequality (Scheidel, 2017). In the early stages of a crisis, the effects are not yet differentiated, but as they persist, they seem to increase inequalities between population groups, reinforce the links between the various dimensions of SWB, and highlight the mechanisms underlying SWB. This observation is aligned with recent studies showing that the prolonged impact of the COVID-19 pandemic has exacerbated existing disparities in SWB and economic stability (Buecker et al., 2021; Wang et al., 2022).

Methodologically, it is interesting that our findings show similar decreasing trends between 2020 and 2022 regardless of the SWB indicator. For instance, the World Happiness Reports show a more stable trend in Finland as well as in other Western countries. However, our results are in line with other Finnish studies using different data sources (e.g., Kestilä & Karvonen, 2023; Koskinen et al., 2023). Still, these differences highlight the need for future research to analyze closer methodological differences between trends in the ladder scores provided by the World Happiness Report and trends in other indicators of life satisfaction.

Our findings underscore the importance of preparing for future crises by strengthening resilience and overall well-being while also implementing targeted actions to support specific vulnerable groups and mitigate adverse impacts on them. For example, students in Finland experienced unique challenges during the pandemic, as universities were among the first institutions to close and the last to reopen. This prolonged isolation significantly increased feelings of loneliness and had potentially negative effects on student well-being (Ventura-León et al., 2022). Intervention strategies could include enriched mental health services, initiatives intended to foster social connections, and financial support to alleviate economic pressures. These measures would not only address the immediate effects of a crisis but also build a more resilient society capable of better handling future disruptions.

The main limitation of our study is that it covered only one country that is traditionally known for its very high levels of SWB. Further comparative research is needed to take contextual factors into account to improve generalizability. Although we used panel data as part of the study, we could not build causal models that clearly attributed changes to the pandemic and other crises. To address this limitation, quasi-experimental designs are needed to more reliably separate the effects of the pandemic from other factors. Finally, we did not consider the respondents' health status or concrete experiences with COVID-19, which could also have influenced the results.

Funding Open Access funding provided by University of Turku (including Turku University Central Hospital).

Declarations

Research Involving Human Participants and/or Animals.

This study was conducted in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The research involved human participants, and no animals were used in this study.

Informed Consent Informed consent was obtained from all individual participants included in the study. Participants were provided with detailed information regarding the study's purpose, procedures, potential risks, and benefits. They were informed of their right to withdraw from the study at any time without any consequences. Confidentiality and privacy of participants' data were assured, and all data were anonymized to protect participants' identities.

Conflict of interest The authors declare that they have no conflict of interest.

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