Ebisawa et al., Gerontechnology (2025) 24:2
https://doi.org/10.4017/gt.2025.24.2.1187.3

Use of mobile phones, living arrangements and subjective well-being among older people: Evidence from a small survey in Japan

Keishi Ebisawa PhD[a,*], Qin Liu PhD[b]

[a]*Department of Health Sciences and Social Welfare, Faculty of Human Sciences, Waseda University, Tokorozawa, Saitama, Japan;* [b]*Research Institute of Social Development, Southwestern University of Finance and Economics, Chengdu, Sichuan, China; *Corresponding author: ebisawa@fuji.waseda.jp*

Abstract

Background: After the COVID-19 pandemic, older people are increasingly expected to use information and communication technology to maintain social relationships and opportunities for social participation.
Research Aim: This study examines how mobile phone use among community-dwelling older adults is related to subjective well-being (SWB). In particular, this study analyzes both social connections through online means, focusing on the purpose of mobile phone use, and real-life connections, which are based on household composition and the residential location of children.
Methods: A postal questionnaire survey was conducted in 2023 targeting residents aged 65 and over living in a city in Japan with a population structure similar to the national average. From a pool of individuals aged 65 and over, 804 participants were randomly selected through simple random sampling and received the survey. There were 280 valid respondents (valid response rate: 34.8%).
Results: Multiple regression analysis revealed that the use of mobile phones for calls and map searches had a statistically positive relationship with subjective well-being (SWB). On the other hand, household composition and the residential location of children were not statistically significant.
Conclusion: Among the purposes of use, 'calls' and 'map searches' were suggested to contribute to the improvement of subjective well-being among older adults.

Keywords: mobile phones, living arrangements, subjective well-being, older people, Japan

Purpose

As of October 2023, Japan's population aged 65 and over reached 36.23 million, accounting for a record-high 29.1% of the total population, whereas the population aged under 15 stood at 14.17 million, making up a record-low 11.4% (Ministry of Internal Affairs and Communications of Japan, 2024a). Furthermore, the declining birthrate and aging population are advancing, with those aged 65 and older expected to constitute 34.8% of the total population by 2040, meaning that one in three individuals will be older (National Institute of Population and Social Security Research of Japan, 2023). Additionally, the rise in single-person elderly households presents a significant issue. In 2022, single-person elderly households numbered 8.73 million, representing 16.1% of all households (Ministry of Health, Labor, and Welfare of Japan, 2022). This number is projected to rise to 10.41 million households, or 20.5% of all households, by 2040 (National Institute of Population and Social Security Research of Japan, 2024). Furthermore, the increasing rate of being unmarried among older people is also a concern. While the unmarried rate for older people was 6.2% in 2020, it is forecasted to rise to 14.3% by 2040 (National Institute of Population and Social Security Research of Japan, 2024). Given these social trends, concerns arise about the physical and mental health impacts on older people living alone or without close relatives, who tend to receive relatively less support for general living needs and emergency response. Considering this situation, the importance of social support is increasingly emphasized.

Since the end of 2019, the COVID-19 pandemic has significantly altered the living environments of older people. Owing to the high risk of severe illness and death among older people, they have had to refrain from going out, leading to a sharp decline in social interactions. On the other hand, information and communication technologies (ICTs), such as online calls and social networking services (SNSs), have been widely adopted as new communication methods, expanding opportunities for social interaction. However, not all older people can easily utilize ICT. In 2023, the percentage of older individuals who used

the internet within the past year was 58.3%, indicating that two out of five older individuals did not use the internet in Japan. (Ministry of Internal Affairs and Communications of Japan, 2024b). Many older individuals find ICT use challenging, which has created a "digital divide," leading to disparities in information access, social relationships, and even opportunities for social support, all of which are assumed to impact their well-being.

Research on ICT in Japan has focused primarily on internet usage. Studies examining the relationship between internet use and well-being have shown that older people who use the internet to communicate with friends and family report higher levels of well-being than nonusers do (Ota et al., 2022). Moreover, older individuals in their 70s and 80s who frequently use the internet tend to experience improved mental health through social activities (Imoto et al., 2023). On the other hand, there is still limited research focusing on the specific usage of digital devices in Japan. This study, therefore, focuses on mobile phone usage among community-dwelling older individuals and examines its association with subjective well-being. Additionally, this study analyzes how real-life social connections with cohabitants and children, in addition to social connections through mobile phones as ICT devices, are related to the subjective well-being of older adults.

Subjective well-being (SWB) is defined as "how satisfied people are with their lives, how frequently they experience positive emotions, and how infrequently they experience negative emotions" (Diener et al., 1984). Research on subjective well-being (SWB) can be categorized into hedonic well-being and eudaimonic well-being. Hedonic well-being focuses on emotional well-being, which is defined by positive emotions and life satisfaction, whereas eudaimonic well-being emphasizes psychological well-being, highlighting human potential and positive functioning. Although reliable measurement methods exist for both aspects, the overall structure of SWB remains insufficiently explored, warranting further research on its broader implications and societal impact (Magyar et al., 2019). Since SWB is assumed to have significant implications for mental, physical, and social well-being, further research is needed to explore its broader meaning. Therefore, this study specifically focuses on the degree of positive emotional experiences, a key component of emotional well-being within SWB, which is assumed to be related to social connections and social participation among older adults.

Although SWB among older people is generally stable, there is variability within individuals and differences between individuals. Additionally, while the initial level of SWB tends to be lower in older individuals, a tendency for SWB to improve with age has also been observed (Nakagawa, 2018-2019). With respect to the relationship between SWB and social support, studies indicate that older people who receive significant support from family and friends, or those with stable income, tend to have greater SWB (Diener et al., 1997; Blanchflower et al., 2004). In terms of face-to-face social participation, involvement in local organizations has been identified as particularly important for SWB (Choi et al., 2021-2022), and participation in local communities and attachment to these communities are also factors that enhance SWB (Seo, 2023).

Furthermore, activities that involve sharing skills or experiences with others, participating in local events, and joining online classes have been shown to positively impact SWB among older adults (Nakada et al., 2024). The use of mobile phones, by facilitating easy access to information and increasing opportunities for social participation, is thought to contribute to improved quality of life and SWB (Nie et al., 2021). Research has suggested that social support, social participation, and social activities are important for improving SWB among older adults. Considering situations such as single-person households, the absence of close relatives, and infection control measures, it is crucial to explore the impact of social connections and social support maintained through ICT on SWB.

The impact of mobile phone usage on SWB varies depending on its purpose. Mobile phone use for communication, such as calls or social networking services (SNSs), positively influences SWB, whereas noncommunication purposes, such as information gathering or gaming, tend to have a negative impact (Buda et al., 2023). This study, which focused on young adults, revealed that smartphone addiction is negatively correlated with SWB. It has also been revealed that loneliness partially mediates this relationship, meaning that smartphone addiction not only directly reduces SWB but also indirectly affects SWB by increasing loneliness (Wacks et al., 2021). Although excessive dependence on social media can reduce SWB, moderate use is reported to strengthen social support, reduce loneliness, and enhance SWB (Bai et al., 2021). These previous studies suggest that the impact of mobile phone use on SWB is multifaceted. This study focuses on mobile phone usage and its purpose, examining the relationship between social connections through online means and SWB. Additionally, it analyzes the associations

between SWB and living support conditions in real life on the basis of the presence of cohabitants and children. In other words, it explores the factors associated with SWB from two perspectives: (1) online connections through ICT use and (2) tangible connections from cohabitants and children. Through this analysis, we aim to provide valuable insights for developing strategies to increase the SWB of older adults.

Research Methodology

Survey method

The study population consisted of individuals aged 65 years and older residing in a city with a population structure comparable to that of Japan, where the aging rate (65 years and older) is approximately 28%, and the proportion of children under 15 years of age is approximately 11%. With the approval of the city government, granted that the survey participants would not be individually identified or disadvantaged and that the data would be used for academic and public interest purposes, the Basic Resident Register was accessed. From this register, 804 individuals were selected via a simple random sampling method and sent a questionnaire survey. (Ministry of Internal Affairs and Communications of Japan, 2009). The survey was conducted via a self-report questionnaire between December 2023 and January 2024. The number of valid respondents was 280, yielding an effective response rate of 34.8%.

Survey items

The survey collected the following demographic information: gender, age, highest level of education, marital status, family composition, and children's place of residence. For health status, the survey assessed SWB, the presence of diseases, the level of care needed, and the status of long-term care insurance service use. The economic status questions covered current employment status, individual annual income (including pensions), and concerns about future living conditions on the basis of current income levels.

This study examines emotional well-being via a 0–10 scale: "How happy do you feel at the moment? Please answer on a scale from 0 to 10, where 0 represents 'very unhappy' and 10 represents 'very happy'." This type of single-item happiness measure has been widely used in research. It appears in Abdel-Khalek's single-item happiness scale (SIHS) (2006) and the OECD Guidelines on Measuring Subjective Well-being (2013), both of which recommend a 0–10 scale for assessing happiness. Additionally, Shin et al. (2023) employed this question in an experience sampling method (ESM), which measures momentary happiness multiple times per day. This method is widely utilized, particularly for measuring individuals' positive emotions within subjective well-being (SWB).

For mobile phone usage, the survey asked about the duration of each use and the purpose of use, including calling, communication via social networking services (SNSs), map searches, information searches, music listening, video viewing, and photography.

Hypotheses and analytical methods

The hypotheses of this study are as follows:

H1: Interactive communication through ICTs, such as calls and SNSs, is positively associated with subjective well-being among older people.

H2: Information acquisition through ICT, such as information search and map search, has a positive association with subjective well-being among older people.

H3: Hobbies and entertainment through ICT, such as watching videos, listening to music, and taking photos, are positively associated with subjective well-being among older people.

Through this study, new insights are expected to be gained regarding the impact of ICTs, such as mobile phones, on the subjective well-being of older people.

For the analytical methods, multiple regression analysis was conducted for Hypotheses H1 to H3. We conducted a standard multiple regression analysis via the enter method, including all independent variables at once. The analysis applied weighting based on the city's gender and age class distribution ratios for the fiscal year 2023, which spans from April 1, 2023, to March 31, 2024. Missing data were handled via multiple imputation, and 10 datasets were created on the basis of the results of Little's missing completely at random (MCAR) test. The software used for statistical analysis was IBM SPSS 29.

Ethical considerations

This study was conducted with the approval of the Waseda University Ethics Review Committee for Research Involving Human Subjects (Approval No. 2022--247). For this survey, all participants provided informed consent in writing, and their consent was considered granted through both written agreement and the return of the completed survey questionnaire. The consent process included detailed written explanations regarding the study's purpose, scope of the survey, handling of personal information, data management practices, the voluntary nature of participation, and the right to withdraw consent even after completing the survey. These steps

Table 1. Basic information (n=280)

Survey item	N	%	Mean
SWB			7.55
Basic attributes			
Gender			
Female = 1	163	58.2	
Male = 0	117	41.8	
Age			77.21
Education			
High school/vocational school/college	199	71.1	
University	81	28.9	
Health condition			
Subjective health			
Not good = 1	48	17.1	
Good = 0	232	82.9	
Disease status			
More than 1 disease = 1	190	68.0	
No disease = 0	90	32.0	
Use of care services			
No = 1	248	88.6	
Yes = 0	32	11.4	
Employment and economic status			
Employment status			
Employed = 1	70	25.0	
Unemployed = 0	210	75.0	
Annual income			
Less than $6,600USD = 1	97	34.6	
More than $6,600USD = 0	183	65.4	
Life anxiety			
Feeling anxious = 1	143	51.1	
Not feeling anxious = 0	137	48.9	
Household and family relations			
Marital status			
Unmarried/divorced/widowed = 1	81	28.9	
With spouse = 0	199	71.1	
Living arrangement			
Living alone = 1	54	19.3	
With coresidents = 0	226	80.7	
Residential area of children			
Not same city = 1	132	47.1	
Same city = 0	148	52.9	
Mobile phone usage			
Time of use in hours			0.77
Purpose (multiple choice)			
Calls = 1	221	78.9	
Communication via SNS = 1	182	65.0	
Map search = 1	113	40.4	
Information search = 1	141	50.4	
Music listening = 1	39	13.9	
Video watching = 1	44	15.7	
Photography = 1	154	55.0	

Note 1: The values in the table are pooled values from 10 datasets created using the multiple imputation method.
Note 2: Mean indicates average value.
Note 3: SWB-Subjective Well-Being, SNS- Social Networking Service.
Note 4: The foreign exchange rate as of February 8, 2025, was used, with 10,000 yen equivalent to approximately 66 US dollars.

were implemented to ensure that the participants had a clear and thorough understanding of their involvement. There are no conflicts of interest in this study.

Results

The results of the multiple regression analysis with SWB as the dependent variable are shown in *Table 2*. First, regarding basic attributes, age was significantly positively associated with SWB ($p<.001$). In contrast, gender and education level were not significantly associated with SWB. With respect to health conditions, "poor health condition" was significantly negatively associated with SWB ($p<.01$). However, the presence of a disease and the use of long-term care services were not significantly associated with SWB.

With respect to employment and economic status, life anxiety was significantly negatively associated with SWB ($p<.001$). However, employment status and annual income were not significantly associated with SWB. With respect to living arrangements, marital status (unmarried, divorced, or widowed), children's place of residence, and living alone were not significantly associated with SWB.

Finally, with respect to mobile phone usage, time of use was not significantly associated with SWB. With respect to the purpose of use, calls and map searches were significantly positively associated with SWB ($p<.001$ and $p<.01$, respectively). In contrast, SNSs, information searches, music listening, video watching, and photography did not significantly influence SWB. These results indicate that SWB is associated with age, health conditions, life anxiety, and mobile phone usage, particularly calls and map searches.

Discussion

The results of the multiple regression analysis indicate that various factors are related to SWB among older individuals. Each factor—basic attributes, health conditions, employment and economic status, living arrangements, and mobile phone usage—is examined concerning its statistical significance and association with SWB.

A similar result was obtained in previous studies. Age is positively correlated with SWB, demonstrating high reliability ($p<.001$), suggesting that as individuals age, their SWB tends to increase (Shimai et al., 2018; Stone et al., 2020). This finding aligns with certain gerontological studies indicating that older individuals may report higher SWB due to shifts in life perspective, prioritizing emotional regulation, and focusing on more meaningful social interactions (Carstensen et al., 1999; Charles et al., 2010; Steptoe et al., 2015). However, gender and education level are not significant predictors of SWB, implying that these demographic factors may not be crucial in influencing well-being in this study.

Among health-related factors, perceiving one's health as "not good" is significantly and negatively associated with SWB ($p<.001$), underscoring the critical link between perceived health status and well-being. Subjective health is influenced by age, medical history, and psychological and social factors and is a strong predictor of mortality, with lower subjective health linked to up to 5.07 times higher mortality risk (Koito et al., 2015). Given its impact on quality of life (QoL)

Table 2. Results of multiple regression analysis with subjective well-being

					95% confidence interval	
	B	**SE**	**t**	**p value**	**Lower limit**	**Upper limit**
Constant	0.60	1.45	0.41	0.680	-2.26	3.46
Basic attributes						
Gender (female = 1)	-0.07	0.27	-0.26	0.798	-0.61	0.47
Age	0.09	0.02	4.88	0.001	0.05	0.12
Education level (university = 1)	-0.20	0.24	-0.85	0.393	-0.67	0.27
Health condition						
Subjective health (not good = 1)	-0.90	0.29	-3.07	0.002	-1.47	-0.32
Disease (more than 1 disease = 1)	-0.34	0.24	-1.41	0.160	-0.80	0.13
Use of care services (no = 1)	-0.72	0.43	-1.69	0.098	-1.58	0.14
Household and family status						
Spouse (unmarried/divorced/widowed = 1)	-0.08	0.36	-0.22	0.825	-0.78	0.63
Living arrangement (living alone = 1)	-0.08	0.36	-0.23	0.817	-0.80	0.63
Residential area of children (not same city = 1)	-0.24	0.21	-1.16	0.244	-0.65	0.17
Employment and economic status						
Employment status (employed = 1)	0.20	0.25	0.80	0.426	-0.29	0.69
Annual income (Less than $6,600USD = 1)	0.28	0.27	1.06	0.289	-0.24	0.81
Life anxiety (feeling anxious = 1)	-0.78	0.21	-3.68	0.001	-1.20	-0.36
Mobile phone usage						
Time of use in hours	0.01	0.10	0.10	0.922	-0.18	0.20
Calls = 1	1.13	0.31	3.66	0.001	0.51	1.74
Communication via SNS = 1	0.40	0.30	1.34	0.184	-0.19	0.99
Map search = 1	0.82	0.27	3.00	0.003	0.28	1.36
Information search = 1	-0.49	0.30	-1.64	0.101	-1.07	0.10
Music listening = 1	0.36	0.37	0.96	0.337	-0.38	1.10
Video watching = 1	-0.19	0.35	-0.55	0.582	-0.87	0.49
Photography = 1	-0.14	0.28	-0.49	0.623	-0.69	0.41

Dependent variable：SWB

Note 1: The values in the table are pooled values from 10 datasets created using the multiple imputation method.

Note 2：B represents the regression coefficient, SE is the standard error.

Note 3: SWB-Subjective Well-Being, SNS- Social Networking Service.

Note 4: The foreign exchange rate as of February 8, 2025, was used, with 10,000 yen equivalent to approximately 66 US dollars.

and survival, a comprehensive approach to health maintenance is crucial. Subjective health and positive emotions are key components of QoL, highlighting the need for both subjective well-being and physical health assessments (Skevington et al., 2018). However, poor subjective health is associated with reduced physical activity, increased stress, and social isolation (Sherman et al., 2024). Social isolation is related to declining physical function, reduced exercise adherence, and worsened mental health (Hawkley et al., 2009; Brandt et al., 2022). Addressing social isolation and psychological distress is essential for improving subjective health and overall well-being, reinforcing the importance of holistic health strategies. In contrast, the presence of a disease and the use of care services are not significantly associated with SWB. This may suggest that the perception of health itself is more influential than the objective presence of disease or assistance, indicating a psychological dimension to well-being among older people.

Life anxiety (a psychological measure) is significantly negatively associated with SWB ($p < .001$). Income is related to increased happiness, but its impact varies by age, cultural values, and socioeconomic conditions. For the working-age population, happiness increases with income, particularly between approximately $26,400 and $52,800 USD (4–8 million yen, based on the exchange rate as of February 8, 2025), but it plateaus at approximately $52,800 USD (8 million yen), where financial stability and savings play a greater role in well-being (Nagasaki, 2023). Across countries and regions, household income is universally related to happiness, yet its impact is shaped more by cultural values than by socioeconomic conditions (Zheng, 2013). Similarly, while income is associated with positive emotions and life satisfaction, its correlation with SWB remains weak, and its effect diminishes beyond a certain level, with psychological and social factors becoming more influential than material wealth (Ishii, 1997). As individuals enter old age and

disengage from economic activities, their values are likely to shift, making psychological and cultural factors more significant for well-being than economic factors are. This finding highlights the role of psychological stressors over economic indicators such as employment status and income, neither of which were found to be significantly related to SWB. The lack of significance in income suggests that SWB may be less influenced by financial resources, potentially due to stable postretirement financing or government support. However, life anxiety reveals the sensitivity of SWB to mental health, suggesting that interventions targeting anxiety reduction could be beneficial.

Interestingly, factors related to living arrangements, including marital status, the residence area of children, and living alone, were not significantly associated with SWB in this study. This could indicate that physical cohabitation or relational status alone is insufficient to impact well-being, possibly reflecting a trend where the quality of social connections, rather than living arrangements, is more relevant for older adults' SWB. This finding calls for further exploration into the role of emotional versus structural aspects of social support.

The analysis of mobile phone usage presents a nuanced picture. Calls and map search functionalities are positively associated with SWB, with calls showing a statistically significant association ($p<.001$). This result might reflect the role of regular communication with social networks and the facilitative effect of technology on maintaining social ties and independence in navigation. The statistical significance of map searches is thought to be closely related to participation in social activities. Surprisingly, other functions, including social networking services (SNSs), information searches, music listening, video watching, and photography, are not significantly associated with SWB. This pattern suggests that more passive forms of digital engagement might not directly contribute to well-being, whereas active communication and practical use (such as navigation) provide tangible benefits.

Conclusion

The analysis underscores the multidimensional nature of SWB among older adults, where age, subjective health, life anxiety, and specific active uses of mobile technology (such as calls and map searches) play significant roles. These findings suggest that enhancing SWB in older individuals may benefit from focusing on improving subjective health perceptions, reducing life anxiety, and encouraging practical, interactive uses of technology. Conversely, purely social or recreational technology use appears less impactful, indicating a potential area for future research into how different types of technology engagement might differentially influence SWB across age groups.

In an era of rapid social change, ICT utilization is becoming increasingly vital for securing local resources and promoting social participation. In Japan, the aging population and declining birth rate have exacerbated the shortage of care workers, leading to the closure of care service providers and widening regional disparities in resource availability. To address these challenges, it is recommended that older adults develop ICT literacy and ensure access to social resources. Enhancing ICT literacy can facilitate not only access to necessary services but also active engagement in social networks and community activities, thereby fostering greater social participation. This study provides valuable evidence for exploring strategies that leverage ICT to reduce uncertainty and anxiety surrounding resource access, promote social participation, and ultimately enhance the SWB of older adults.

Limitations and future directions

This study's analysis results present several limitations. First, the cross-sectional design makes it challenging to establish causality, which prevents capturing the directionality of effects and changes over time. Second, sample bias is a concern. Although participants were randomly selected from residents aged 65 and older in the city and weighted according to the population structure, the effective response rate was 34.8%, which implies potential bias. Additionally, the characteristics of older adults who participate may differ from those of those who do not participate. Notably, no respondents had a high level of care; however, in reality, some older adults with higher care needs live at home with family support or care services. The self-report questionnaire survey raises concerns about self-report bias. In assessing SWB, participants might underestimate or overestimate their condition. This issue is especially relevant for older adults, who may struggle to accurately report past events or current states. Furthermore, unmeasured confounding factors, such as social support and the local social environment, might influence SWB. Future studies should adopt a longitudinal design to track changes over time, which would facilitate a more accurate understanding of causal relationships. Collecting data through methods that are less dependent on self-reports and identifying and appropriately controlling for unmeasured confounders will also be essential for obtaining more precise results.

Acknowledgments
This study was supported by the Waseda University "Specific Research Project Fund," for which we express our sincere gratitude. We would also like to extend our heartfelt thanks to the staff of City Hall, Citizen's Affairs Section, for their cooperation. Furthermore, we are deeply grateful to the older residents of the city who participated in the survey. Thank you very much.

References

Steptoe, A., Deaton, A., & Stone, A. A. (2015). Subjective well-being, health, and aging. The Lancet, 385(9968), 640–648. https://doi.org/10.1016/S0140-6736(13)61489-0

Stone, A. A., Broderick, J. E., Wang, D., & Schneider, S. (2020). Age patterns in subjective well-being are partially accounted for by psychological and social factors associated with aging. PLoS ONE, 15(12), e0242664. https://doi.org/10.1371/journal.pone.0242664

Hawkley, L. C., Thisted, R. A., & Cacioppo, J. T. (2009). Loneliness predicts reduced physical activity: Cross-sectional & longitudinal analyses. Health Psychology, 28(3), 354–363. https://doi.org/10.1037/a0014400

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1984). Subjective well-being. Psychological Bulletin, 95(3), 542–575. https://doi.org/10.1037/0033-2909.95.3.542

Diener, E., & Suh, E. (1997). Measuring quality of life: Economic, social, and subjective indicators. Social Indicators Research, 40, 189–216. https://doi.org/10.1023/A:1006859511756

Blanchflower, D. G., & Oswald, A. J. (2004). Well-being over time in Britain and the USA. Journal of Public Economics, 88(7–8), 1359–1386. https://doi.org/10.1016/S0047-2727(02)00168-8

Shin, W. G., Jyung, M., Choi, I., & Sul, S. (2023). Perceived financial well-being and its association with frontostriatal functional connectivity, real-life anticipatory experiences, and everyday happiness. Scientific Reports, 13(1), 18739. https://doi.org/10.1038/s41598-023-44001-0

Bai, J., Mo, K., & Peng, Y. (2021). The relationship between the use of mobile social media and subjective well-being: The mediating effect of boredom proneness. Frontiers in Psychology, 11. https://doi.org/10.3389/fpsyg.2020.568492

Magyar, J. L., & Keyes, C. L. M. (2019). Defining, measuring, and applying subjective well-being. In M. W. Gallagher & S. J. Lopez (Eds.), Positive psychological assessment: A handbook of models and measures (2nd ed., pp. 389–415). American Psychological Association. https://doi.org/10.1037/0000138-025

Brandt, L., Liu, S., Heim, C., & Heinz, A. (2022). The effects of social isolation stress and discrimination on mental health. Translational Psychiatry, 12(1), 398. https://doi.org/10.1038/s41398-022-02178-4

Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. American Psychologist, 54(3), 165–181. https://doi.org/10.1037/0003-066X.54.3.165

Abdel-Khalek, A. M. (2006). Measuring happiness with a single-item scale. Social Behavior and Personality: An International Journal, 34(2), 139–150. https://doi.org/10.2224/sbp.2006.34.2.139

Skevington, S. M., & Böhnke, J. R. (2018). How is subjective well-being related to quality of life? Do we need two concepts and both measures? Social Science & Medicine, 206, 22–30. https://doi.org/10.1016/j.socscimed.2018.04.005

Nakada, T., Nozawa, T., & Seino, S. (2024). A community-based intervention to enhance subjective well-being in older adults: Study design and baseline participant profiles. Healthcare, 12(3), 322. https://doi.org/10.3390/healthcare12030322

OECD. (2013). OECD guidelines on measuring subjective well-being. OECD Publishing. https://www.oecd.org/statistics/oecd-guidelines-on-measuring-subjective-well-being-9789264191655-en.htm

Nie, P., Ma, W., & Sousa-Poza, A. (2021). Relationship between smartphone use and subjective well-being in rural China. Electronic Commerce Research. https://doi.org/10.1007/s10660-020-09397-1

Buda, T. S., Khwaja, M., & Garriga, R. (2023). Two edges of the screen: Unpacking positive and negative associations between phone use in everyday contexts and subjective well-being. PLOS ONE, 18(4), e0284104. https://doi.org/10.1371/journal.pone.0284104

Charles, S. T., & Carstensen, L. L. (2010). Social and emotional aging. Annual Review of Psychology, 61, 383–409. https://doi.org/10.1146/annurev.psych.093008.100448

Sherman, D. W., Alfano, A. R., Alfonso, F., Duque, C. R., Eiroa, D., Marrero, Y., Muñecas, T., Radcliffe-Henry, E., Rodriguez, A., & Sommer, C. L. (2024). A systematic review of the relationship between social isolation and physical health in adults. Healthcare (Basel), 12(11), 1135. https://doi.org/10.3390/healthcare12111135

Seo, Y. (2023). Community attachment as a factor in the subjective well-being of older adults in urban and rural areas: A case study in Tokyo, Osaka, and Shikoku region in Japan. Asia-Pacific Journal of Regional Science, 7, 1123–1140. https://doi.org/10.1007/s41685-023-00310-w

Wacks, Y., & Weinstein, A. M. (2021). Excessive smartphone use is associated with health problems in adolescents and young adults. Frontiers in Psychiatry, 12, 669042. https://doi.org/10.3389/fpsyt.2021.669042

Choi, H., Gondo, Y., & Masui, Y. (2021–2022). Associations between social participation, social capital, and subjective well-being in older adults. Japanese Journal of Gerontology, 43(1), 5–14. https://doi.org/10.34393/rousha.43.1_5 (in Japanese)

Imoto, C., Katsuhara, Y., Nakata, Y., Yamashita, K., Yamada, E., Ueda, K., Tamura, R., Chen, Y., Fujimoto, T., Manabe, K., Hirotsu, K., Hasegawa, S., Suito, M., Tokuda, K., & Yoshimura, K. (2023). Association between smartphone usage frequency and number of social interactions among older adults. Yamaguchi Prefectural University Journal of Academic Information: Graduate School Jour-

nal, 16, 87–93. Retrieved from https://cir.nii.ac.jp/crid/1050014713340158592 (in Japanese)
Ishii, R. (1997). Recent research trend of subjective well-being studies. Japanese Journal of Community Psychology, 1(1), 94–107. https://doi.org/10.32236/jscpjournal.1.1_94 (in Japanese)
Koito, S., Kawamoto, R., Suzuki, M., Uemoto, A., Kumagi, T., Ninomiya, D., & Abe, M. (2015). Effects of background factors on subjective health and survival rate among community-dwelling persons. An Official Journal of the Japan Primary Care Association, 38(3), 214–220. https://doi.org/10.14442/generalist.38.214 (in Japanese)
Ministry of Health, Labor, and Welfare. (2022). Comprehensive survey of living conditions. Retrieved from https://www.mhlw.go.jp/toukei/list/20-21.html (in Japanese)
Ministry of Internal Affairs and Communications of Japan. (2009). Overview of the large-scale survey system. Retrieved from https://www.soumu.go.jp/main_sosiki/jichi_gyousei/daityo/gaiyou.html (in Japanese)
Ministry of Internal Affairs and Communications of Japan. (2024a). Population estimates. Retrieved from https://www.stat.go.jp/data/jinsui/index.html (in Japanese)
Ministry of Internal Affairs and Communications of Japan. (2024b). Statistical data on population estimates. Retrieved from https://www.e-stat.go.jp/stat-search/files?page=1&layout=datalist&toukei=00200356&tstat=000001218300&cycle=0&tclass1=000001218303&stat_infid=000040185447&cycle_facet=cycle&tclass2val=0&metadata=1&data=1 (in Japanese)
Nakagawa, T. (2018–2019). Stability and change in subjective well-being in old age. Japanese Journal of Gerontology, 40(1), 22–31. https://doi.org/10.34393/rousha.40.1_22 (in Japanese)
Nagasaki, T. (2023). Subjective well-being measurement in Japan: An examination of the 0–10 scale (11-point method). IFI Working Paper No. 24. University of Tokyo Institute for Future Initiatives. Retrieved from https://ifi.u-tokyo.ac.jp/en/publications/working-paper-24/ (in Japanese)
National Institute of Population and Social Security Research of Japan. (2023). Population projections for Japan. Retrieved from https://www.ipss.go.jp/pp-zenkoku/j/zenkoku2023/pp_zenkoku2023.asp (in Japanese)
National Institute of Population and Social Security Research. (2024). Household projections for Japan. Retrieved from https://www.ipss.go.jp/pp-ajsetai/j/HPRJ2024/t-page.asp (in Japanese)
Ota, Y., Saito, M., Nakagomi, A., & Kondo, K. (2022). Association between internet use, health, and well-being among older adults. Japanese Journal of Gerontology, 44(1), 9–18. https://doi.org/10.34393/rousha.44.1_9 (in Japanese)
Shimai, S., Yamamiya, Y., & Fukuda, S. (2018). Subjective happiness among Japanese adults: An upward tendency associated with age. Nihon Koshu Eisei Zasshi (Japanese Journal of Public Health), 65(9), 553–562. https://doi.org/10.11236/jph.65.9_553 (in Japanese)
Zheng, Y. (2013). The reality and influencing factors of subjective well-being: Focusing on an international comparison of Asia-Pacific values. The Behaviormetric Society of Japan, 326–329. (in Japanese)